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Section 0

General Information

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General Information

General Information

Introduction

RPO Code List

The following table provides the description of the Regular Production Option (RPO) codes that are available on the vehicle. The vehicle's RPO list is printed on the Service Parts Identification Label.

RPO	Description
00J	IDENTIFICATION - EQUIPPED WITH SENSING DIAGNOSTIC MODULE DESIGN 2
1CX	PACKAGE - CX OPTION 1
1LT	PACKAGE - LT OPTION 1
1LZ	PACKAGE - LZ OPTION 1
1WT	PACKAGE - WT OPTION 1
3LT	PACKAGE - LT OPTION 3
3LZ	PACKAGE - LZ OPTION 3
4AA	INTERIOR TRIM - JET BLACK
4AK	INTERIOR TRIM - JET BLACK/CAPTAIN BLUE
4JJ	INTERIOR TRIM - GIDEON/VY DK ATMOSPHERE
4JS	INTERIOR TRIM - JET BLACK/UMBER
4KW	INTERIOR TRIM - JET BLACK / ARTEMIS
5A7	WHEEL SPARE - NONE
5JY	ACCESSORY - TONNEAU - RR COMPT - SOFT FOLDING
5K4	ACCESSORY - DECAL PACKAGE - BODYSIDE - DESIGN 2
5LE	ACCESSORY - GARAGE DOOR OPENER
5VE	ACCESSORY - EXHAUST TIP - DESIGN 5
5VG	ACCESSORY - EXHAUST TIP - DESIGN 4
5VI	ACCESSORY - TIE DOWN RINGS - CARGO AREA
65C	LABEL, WARNING - CALIFORNIA, PROP 65 COMPLIANT
6K5	GATE FUNCTION - POWER
6K5	GATE TYPE - PUBX END ENHANCED
6K5	IMAGE ADJUSTMENT - HITCH VIEW
6K5	INDICATOR - SMART TRAILER INTEGRATION
6K5	LAMP - CARGO
6K5	OPENER - GARAGE DOOR, UNIVERSAL
6K5	WINDOW RR - FULL WIDTH, SLIDING, POWER
6K5	SALES PACKAGE - CONVENIENCE II
77S	LABEL, REGULATORY - CALIFORNIA, SECTION 177 STATES
9J4	BUMPER RR - (NONE)
9L3	TIRE SPARE - NONE
9L7	EQUIPMENT - ACSRY WRG JUNC BLK
A2S	ADJUSTER DRIVER SEAT - 4WAY, DISCONT MAN RECLINE, MAN FORE/AFT
A2X	ADJUSTER DRIVER SEAT - 8WAY, PWR RECLINE, PWR FORE/AFT, PWR HEIGHT, PWR TILT
A45	MEMORY - SEAT ADJUSTER, MIRROR, POWER, DRIVER, PERSONALIZATION
A48	WINDOW RR - FULL WIDTH, SLIDING, POWER
A4H	HANDLING CHARGE - SHIP THROUGH TO GROUND EFFECT, OSHAWA, CANADA
A50	SEAT - FRT BKT
A60	LOCK CONTROL RR CMPT - LID, TAILGATE, KEY ACTIVATED
A68	SEAT RR - SPLIT, FOLDING
A7E	ADJUSTER PASS ST - 4WAY, DISCONT MAN RECLINE, MAN FORE/AFT
A7K	ADJUSTER PASS ST - 8WAY, PWR RECLINE, PWR FORE/AFT, PWR HEIGHT, PWR TILT
AAK	ACCESSORY - FLOOR LINER - CONTOURED - ALT DESIGN 1
AAO	ACCESSORY - FLOOR LINER - CONTOURED - ALT DESIGN 2
AED	WINDOW REG PASS DR - POWER OPERATED,EXPRESS DOWN
AEF	WINDOW REG PASS DR - POWER OPERATED, EXPRESS UP/DOWN
AEQ	WINDOW REG REAR DR - POWER OPERATED, EXPRESS DOWN
AKO	WINDOW TYPE - PRIVACY
AKP	WINDOW TYPE - SOLAR ABSORBING
AL0	SENSOR INDICATOR - INFLATABLE RESTRAINT, FRT PASS/CHILD PRESENCE DETECTOR
ANM	SALES PACKAGE - FIRE AND RESCUE
ANQ	COVERING FLOOR - RUBBER
ANQ	DECAL - ALASKAN
ANQ	DECAL - PICK UP BOX - DELETE
ANQ	EQUIPMENT - SUPPLIER INSTALLED
ANQ	LAMP - FIVE, ROOF MARKER, TRUCK
ANQ	LINER - PUBX, SPRAY ON
ANQ	PROVISIONS - SNOW PLOW PREP
ANQ	TIRE ALL - LT275/65R20 E 126/123 S BW AT VAR 1

RPO	Description
ANQ	TIRE ALL - LT275/65R20 E 126/123 S BW OOR VAR 1
ANQ	TIRE ALL - LT275/70R18 E 125/122 S BW AT VAR 1
ANQ	WHEEL - 18 X 8.0, J, ALUMINUM, DESIGN 2
ANQ	WHEEL - 20 X 8.5 - J - ALUMINUM - DESIGN 21
ANQ	SALES PACKAGE - SNOW PLOW SPECIAL EDITION
AQQ	LOCK CONTROL, ENTRY - REMOTE ENTRY, EXTENDED RANGE (MY 09 AND FUTURE)
AU3	LOCK CONTROL - SIDE DR, ELEC
AVI	RESTRAINT PROVISIONS - ADJUSTABLE GUIDE LOOP
AVJ	LOCK CONTROL, ENTRY - REMOTE ENTRY, EXTENDED RANGE, PASSIVE ENTRY, FRONT DOORS
AXG	WINDOW REG DRVR DR - POWER OPERATED, EXPRESS UP/DOWN
AXK	VEHICLE TYPE - TRUCK
AY0	RESTRAINT SYSTEM - SEAT, INFLATABLE, DRIVER & PASS FRT, SEAT SIDE, ROOF SIDE
AZ3	SEAT - FRT SPLIT, DRIVER, PASS, FULL FEATURE CENTER
B1J	LINER - RR WHEELHOUSE
B26	ALERT - SAFETY HAPTIC SEAT
B26	INDICATOR - SMART TRAILER INTEGRATION
B26	PARK ASSIST - FRONT AND REAR
B26	REAR CROSS TRAFFIC - ALERT
B26	SIDE ACTIVE SAFETY - OBSTACLE DETECTION ENHANCED
B26	SIDE ACTIVE SAFETY - OBSTACLE DETECTION ENHANCED, EXTENDED TRAILER VIEW
B26	VISION - 360 VIEW, MONO, HD DIGITAL
B26	VISION AUXILIARY - CARGO BED
B26	VISION TRAILER - INSIDE VIEW, REAR VIEW
B26	SALES PACKAGE - SAFETY PACKAGE VAR. 1
B30	COVERING FLOOR - CARPET
B32	COVERING FRT - FLOOR MATS, AUX
B33	COVERING REAR - FLOOR MATS, AUX
B34	COVERING FRT - FLOOR MATS, CARPETED INSERT
B35	COVERING REAR - FLOOR MATS, CARPETED INSERT
B3L	STEPS, RUNNINGBOARD - SIDE, RETRACTABLE, POWER, BLACK

RPO	Description
B59	DEFOGGER - RR WINDOW, ELECTRIC
B59	REMOTE START - VEHICLE
B59	THEFT DETERENT - ELECTRICAL, UNAUTHORIZED ENTRY
B59	SALES PACKAGE - FUNCTIONAL PACKAGE
BG9	COVERING FLOOR - RUBBER
BHP	COVER - WINTER GRILLE
BPH	BRK APL CTRL FEATURE - HILL DESCENT, GEAR HOLD
BPH	CHASSIS PACKAGE - "OFF ROAD"
BPH	SALES PACKAGE - SKID PLATE, "OFF ROAD" SPORT
BPH	TIRE ALL - LT265/60R22 E 123/120S BW AT VAR 1
BPH	TIRE ALL - LT265/70R17 E 121/118 Q BW AT
BPH	TIRE ALL - LT275/65R20 E 126/123 S BW AT VAR 1
BPH	TIRE ALL - LT275/65R20 E 126/123 S BW OOR VAR 1
BPH	TIRE ALL - LT275/70R18 E 125/122 S BW AT VAR 1
BPH	APPEARANCE PACKAGE - CHEVROLET "OFF ROAD"
BRS	STEPS, RUNNINGBOARD - SIDE, RETRACTABLE, POWER, BRIGHT
BTM	SWITCH - START, KEYLESS
BTV	REMOTE START - VEHICLE
BVQ	STEPS, RUNNINGBOARD - SIDE, TUBULAR, CHROME
BWN	STEPS - CORNER ASSIST, BUMPER
C32	HEATER AIR SYSTEM - HEATING/ DEFROSTER SYSTEM, REINFORCED, ELECTRIC
C49	DEFOGGER - RR WINDOW, ELECTRIC
C59	VENT - AIR, CONSOLE, RR
C67	HVAC SYSTEM - AIR CONDITIONER FRT, ELECTRONIC CONTROLS
CE1	WIPER SYS WINDSHIELD - PULSE, MOISTURE SENSITIVE
CF5	ROOF - SUN, GLASS, SLIDING, ELEC
CGN	LINER - PUBX, SPRAY ON
CGO	COLLECTION GVW - COLLECTION GVW LESS THAN OR EQUAL TO 10,000 LBS
CJ2	HVAC SYSTEM - AIR CONDITIONER FRT, AUTO TEMP CONT, AUX TEMP CONT
CMD	PLANT CODE - FLINT, MI, USA (TRK)
CMT	BRK APL CTRL FEATURE - INTEGRATED TRAILER BRAKE
CMT	LINER - PUBX, SPRAY ON

RPO	Description
CMT	PROVISIONS - SPECIAL EQUIPMENT, 5TH WHEEL/ GOOSENECK TRAILER HITCH PREP PACKAGE
CMT	SALES PACKAGE - GOOSE NECK/5TH WHEEL PREP AND CAMERA
CTT	HITCH ASSIST - GUIDELINES
CWK	BUMPER FRT - COLOR
CWK	BUMPER RR - COLOR KEYED
CWK	HOOK - TOW
CWK	WHEEL - 20 X 8.5 - J - ALUMINUM - DESIGN 21
CWK	SALES PACKAGE - BLACK-OUT
CWM	CRUISE CONTROL - AUTOMATIC, ADAPTIVE, WITH STOP/GO
CWM	HEAD UP DISPLAY - WINDSHIELD
CWM	MIRROR I/S R/V - LT SENSITIVE, FULL VIDEO DISPLAY
CWM	SALES PACKAGE - TECHNOLOGY
CXH	INTERIOR TRIM CONFIG - LEATHER, LEVEL 1, GIDEON/VY DK ATMOSPHERE
CXH	INTERIOR TRIM CONFIG - LEATHER, LEVEL 1, JET BLACK
CXH	SEAT RR - SPLIT, FOLDING, DELUXE STORAGE
CXH	SALES PACKAGE - INTERIOR LEATHER PACKAGE
D07	CONSOLE - FRT COMPT, FLOOR, CUSTOM
D31	MIRROR I/S R/V - TILT
D72	HANDLE O/S DOOR - BLACK
D75	HANDLE O/S DOOR - BODY COLOR
DBG	MIRROR O/S - MAN EXT, PWR ADJ, HEAT, MAN FOLD, TURN SIG, AUX CLR, FLAT DRVR/PASS, WFOV DRVR/PASS
DD8	MIRROR I/S R/V - LT SENSITIVE
DH6	MIRROR I/S FRT VAN - LH & RH, SUNSHADE, ILLUM
DLN	MIRROR O/S - LH & RH, ELEC REMOTE CONTROL, HEATER, MANUAL FOLD, FLAT/DRVR, FLAT/PASS
DMQ	DECAL - ALASKAN
DN1	DECAL - PICK UP BOX - DELETE
DNS	EQUIPMENT - SUPPLIER INSTALLED
DP6	MIRROR PROVISIONS - HOUSING, PAINTED
DP9	MIRROR PROVISIONS - HOUSING, CHROME
DRC	MIRROR I/S R/V - LT SENSITIVE, PARTIAL VIDEO DISPLAY
DRZ	MIRROR I/S R/V - LT SENSITIVE, FULL VIDEO DISPLAY

RPO	Description
DUD	MIRROR O/S - LH & RH, WFOV, MANUAL, MAN FOLD, MAN EXT, FLAT/COVN DR/ PASS
DWI	MIRROR O/S - LH&RH,WFOV,MAN EXT,PWR FLD,HTD,TURN SIG,R/ CON,ELEC,AUX CARGO,AUX CLR,PERM LIGHT,FLAT LT SENS DR/PAS
DZC	MIRROR O/S - LH&RH,WFOV,PWR EXT,PWR FOLD,HTD,TURN SID,R/CON MEM,AUX CARGO,AUX CLR,PERM LT,FLAT LT SENS DR/PAS
DZW	CHASSIS - DUAL REAR WHEEL, RIDE & HANDLING
E20	HANDLE O/S DOOR - CHROME
E63	BODY EQUIPMENT - FLEETSIDE PICK-UP BOX
EF7	COUNTRY - UNITED STATES OF AMERICA (USA)
F48	CHASSIS DRIVE LINE - ALL WHEEL DRIVE (AWD)/FOUR WHEEL DRIVE(4WD), DRIVER SELECT
F60	SPRING FRONT - HEAVY DUTY
FE9	CERTIFICATION - EMISSION, FEDERAL
FHS	VEHICLE FUEL - GASOLINE E85
FHX	VEHICLE FUEL - DIESEL B20
FJW	VEHICLE FUEL - GASOLINE E15
FPF	EQUIPMENT - EMISSION-DIESEL DPF MANUAL REGENERATION
G42	PRIMARY COLOR - EXTERIOR, WHITE SANDS SOLID (234L)
G4J	PRIMARY COLOR - EXTERIOR, POLAR WHITE TRI MET-1 (241L)
G7C	PRIMARY COLOR - EXTERIOR, PULL ME OVER RED SOLID (130X)
G80	AXLE POSITRACTION - LIMITED SLIP
G94	AXLE - RR ELECTRONIC LOCKING DIFFERENTIAL, DRIVER SELECT
GAZ	PRIMARY COLOR - EXTERIOR, SUMMIT WHITE (G) 8624
GBA	PRIMARY COLOR - EXTERIOR, BLACK (G) 8555
GBD	PRIMARY COLOR - EXTERIOR, AEGEAN SOLID (229K)
GF2	TRIM PACKAGE - CUSTOM
GF3	TRIM PACKAGE - LT
GF5	TRIM PACKAGE - WORK TRUCK
GF9	TRIM PACKAGE - LTZ
GFD	TRIM PACKAGE - HIGH COUNTRY
GNT	PRIMARY COLOR - EXTERIOR, RADIANT RED TINT MET-1 (170H)
GRZ	TRIM PACKAGE - ZR2
GT4	AXLE REAR - 3.73 RATIO
GTY	AXLE - WIDE TRACK

RPO	Description
GU6	AXLE REAR - 3.42 RATIO
GXD	PRIMARY COLOR - EXTERIOR, SHARKSKIN MET-1 (130H)
GXP	PRIMARY COLOR - EXTERIOR, COSMONAUT MET-1 (136H)
H0U	INTERIOR TRIM CONFIG - CLOTH, LEVEL 2, JET BLACK
H0Y	INTERIOR TRIM CONFIG - LEATHER, LEVEL 1, JET BLACK
H1T	INTERIOR TRIM CONFIG - CLOTH, LEVEL 1, JET BLACK
H1Y	INTERIOR TRIM CONFIG - LEATHER, LEVEL 2, JET BLACK
H2G	INTERIOR TRIM CONFIG - VINYL, LEVEL 1, JET BLACK
H37	INTERIOR TRIM CONFIG - LEATHER, LEVEL 7, JET BLACK / ARTEMIS
H38	INTERIOR TRIM CONFIG - LEATHER, LEVEL 8, JET BLACK / CAPTAIN BLUE
HF0	INTERIOR TRIM CONFIG - LEATHER, LEVEL 8, JET BLACK / UMBER
HS1	ALERT - SAFETY HAPTIC SEAT
HV5	INTERIOR TRIM CONFIG - CLOTH, LEVEL 2, GIDEON/VY DK ATMOSPHERE
HVC	INTERIOR TRIM CONFIG - LEATHER, LEVEL 1, GIDEON/VY DK ATMOSPHERE
HVE	INTERIOR TRIM CONFIG - LEATHER, LEVEL 2, GIDEON/VY DK ATMOSPHERE
HXC	INTERIOR TRIM CONFIG - LEATHER, LEVEL 8, JET BLACK
ICY	ACCESSORY - ARCTIC HOSE - POWER STEERING
IOK	RADIO - INFOTAINMENT SYSTEM - 3.X MID/HIGH HMI,ENHANCED CONNECTIVITY 2.0, VOICE RECOGNITION
IOR	RADIO - INFOTAINMENT SYSTEM - 3.X LOW HMI, MIDLEVEL CONNECTIVITY 3.X
J26	ENGINEERING YEAR - 2026
J61	BRAKE SYSTEM - POWER, FRT & RR DISC, ABS, 17"
JBP	BRAKE LINING WEAR SY - LIFE SPAN PROGNOSTIC INDICATOR
JHD	BRK APL CTRL FEATURE - HILL DESCENT, GEAR HOLD
JL1	BRK APL CTRL FEATURE - INTEGRATED TRAILER BRAKE
K05	HEATER ENG - BLOCK
K1O	FILTER MONITOR - ENGINE AIR
K34	CRUISE CONTROL - AUTOMATIC, ELECTRONIC
K40	ENGINE BRAKE - EXHAUST
K47	AIR CLEANER - HIGH CAPACITY
K4C	CHARGER - INDUCTIVE PORTABLE WIRELESS DEVICE

RPO	Description
K4Z	BATTERY - LN3, AGM, 12V, 70AH, 700 CCA, AUX
KA1	HEATER SEAT FRT - DRVR & PASS
KA6	HEATER SEAT - REAR
KC4	COOLING SYSTEM - ENG OIL
KC5	RECEPTACLE - ELECTRICAL, ACCESSORY
KC9	RECEPTACLE PUBX - ELECTRICAL, 110 VOLT
KGU	MODULE - UPFITTER, SERIAL DATA GATEWAY
KHF	GENERATOR - 170 AMP AND 220 AMP, DUAL
KI3	STEERING WHEEL HEAT - AUTOMATIC
KI4	RECEPTACLE I/P - ELECTRICAL, 110 VOLT
KNP	COOLING SYSTEM - TRANS, HD
KQV	HEATER - SEAT, VENTED, FRT
KSG	CRUISE CONTROL - AUTOMATIC, ADAPTIVE, WITH STOP/GO
KW5	GENERATOR - 220 AMP
KW7	GENERATOR - 170 AMP
L5P	ENGINE - DIESEL, 8 CYL, 6.6L, DI, V8, TURBO, DURAMAX, GEN 5, VAR. 1
L8T	ENGINE - GAS, 8 CYL, 6.6L, SIDI, VVT, CAST IRON
M1F	POWER TAKE OFF - RR PTO
MAH	MARKETING AREA - US, PUERTO RICO/ USVI
MGM	TRANSMISSION - AUTO 10 SPD, 10L1000, GRX, GEN 1, VAR 1
MGU	TRANSMISSION - AUTO 10 SPD, 10L1000, GRX, GEN 2, VAR 2
MKM	TRANSMISSION - AUTO 10 SPD, RWD 4.54 1ST, 2.86 2ND, 2.06 3RD, 1.71 4TH, 1.48 5TH, 1.26 6TH, 1.00 7TH, 10L1001
N06	STEERING COLUMN LOCK - ELECTRICAL
N2L	FUEL TANK - REAR TANK 40 GAL (151L)
N2N	FUEL TANK - DUAL TANK, FRONT TANK 23.5 GAL (89L) REAR TANK 40 GAL (151L)
N33	STEERING COLUMN - TILT TYPE
N37	STEERING COLUMN - TILT, TELESCOPING
N57	STEERING WHEEL - SYNTHETIC, 4 SPOKE, THIN, ROUND
N79	WHEEL SPARE - 18 X 8.0, J, STEEL, DESIGN 2
NB5	EXHAUST SYSTEM - SINGLE
NE1	CERTIFICATION - EMISSION, GEOGRAPHICALLY RESTRICTED REGISTRATION
NHT	BRK APL CTRL FEATURE - INTEGRATED TRAILER BRAKE

RPO	Description
NHT	ENGINE - DIESEL, 8 CYL, 6.6L, DI, V8, TURBO, DURAMAX, GEN 5, VAR. 1
NHT	PROVISIONS - SPECIAL EQUIPMENT, 5TH WHEEL/ GOOSENECK TRAILER HITCH PREP PACKAGE
NHT	TRAILER PROVISIONS - SPECIAL EQUIPMENT, H.D.
NHT	WHEEL - 18 X 6.5, J, ALUMINUM, DESIGN 1
NHT	PERFORMANCE PACKAGE - ENHANCED TOWING
NK5	STEERING WHEEL - STANDARD
NLI	EMISSION SYSTEM - ULEV200/BIN200: CA LEV4/FED TIER3, 8.5K-10K GVW
NLJ	EMISSION SYSTEM - SULEV170/BIN170: CA LEV4/FED TIER3, 8.5K-10K GVW
NLQ	EMISSION SYSTEM - ULEV270/BIN270: CA LEV4/FED TIER3, 10K-14K GVW
NLR	EMISSION SYSTEM - SULEV230/BIN230: CA LEV4/FED TIER3, 10K-14K GVW
NQF	TRANSFER CASE - ELECTRIC SHIFT CONT, TWO SPEED, ALUM
NQH	TRANSFER CASE - ACTIVE, TWO SPEED, SWITCH ACTIVATED, ALUM
NV8	STEERING - POWER, MAGNETIC SPEED, VARIABLE ASSIST
NZ4	WHEEL SPARE - 17 X 7.5, J, STEEL, DESIGN 2
NZZ	SALES PACKAGE - SKID PLATE, "OFF ROAD" SPORT
OST	PLANT CODE - OSHAWA 2, ONT, CANADA
P03	COVER, WHEEL - VAR 3
P06	TRIM DISCS - WHEEL
PPW	PHONE PROJECTION - PHONE PROJECTION WIRELESS
PTO	ENGINE CONTROL - POWER TAKE OFF (PTO) CONTROLS
PTT	TRAILER TIRE PRESSUR - MANUAL LEARN
PTW	WHEEL - 18 X 8.0, J, ALUMINUM, DESIGN 2
PYN	WHEEL - 17 X 7.5, J, STEEL, DESIGN 7
PYQ	WHEEL - 17 X 7.5, J, ALUMINUM, DESIGN 7
PYT	WHEEL - 18 X 8.0, J, STEEL, DESIGN 2
PYV	WHEEL - 18 X 8.0, J, ALUMINUM, DESIGN 23
PYW	WHEEL - 17 X 6.5, J, STEEL, DESIGN 2
PZ8	IMAGE ADJUSTMENT - HITCH VIEW
PZG	PLATE - SKID FRT
PZN	PLATE - SKID TRANSFER CASE
PZZ	PLATE - FRT UNDERBODY, SKID

RPO	Description
Q21	WHEEL - 18 X 6.5, J, ALUMINUM, DESIGN 1
Q7Q	WHEEL - 20 X 8.5, J, ALUMINUM, DESIGN 12
Q86	WHEEL - 20 X 8.5, J, ALUMINUM, DESIGN 25
QF6	TIRE ALL - LT275/70R18 E 125/122 S BW AT VAR 1
QF9	TIRE ALL - LT275/65R20 E 126/123 S BW AT VAR 1
QFG	TIRE ALL - LT275/65R20 E 126/123 S BW OOR VAR 1
QHQ	TIRE ALL - LT245/75R17 E 121/118R BW ALS
QHY	TIRE ALL - LT235/80R18 E 121/118R BW AT
QK1	GATE TYPE - PUBX END STANDARD
QK2	GATE TYPE - PUBX END ENHANCED
QMG	TIRE ALL - LT305/70R18 E 126/123 R BW OOR VAR 1
QN5	WHEEL SPARE - 17 X 7.5, J, ALUMINUM, DESIGN 1
QNJ	WHEEL SPARE - 18 X 9.0, J, ALUMINUM, DESIGN 2
QNO	WHEEL SPARE - 18 X 9.0, J, ALUMINUM, DESIGN 4
QNZ	TIRE SPARE - LT305/70R18 E 126/123 R BW OOR VAR 1
QT2	GATE FUNCTION - MANUAL
QT5	GATE FUNCTION - MANUAL ASSIST POWER RELEASE
QT6	GATE FUNCTION - POWER
QXT	TIRE ALL - LT265/70R17 E 121/118 Q BW AT
QZT	TIRE ALL - LT235/80R17 E 120/117R BW AT
R5K	WHEEL - 18 X 6.5, J, STEEL, DESIGN 1
R7O	SEAT RR - SPLIT, FOLDING, BASE STORAGE
RB9	WHEEL - 18 X 9.0, J, ALUMINUM, DESIGN 2
RDI	ACCESSORY - KEYLESS ENTRY
REM	ACCESSORY TIRE - TIRE ALL - LT275/65R20 E 126/123 S BW AT VAR 1
RF9	WHEEL - 18 X 9.0, J, ALUMINUM, DESIGN 4
RIA	ACCESSORY - FLOOR LINER - CONTOURED
RIK	ACCESSORY - BADGE - EXTERIOR, PACKAGE, DESIGN 1
RN6	WHEEL - 22 X 8.5, J, STEEL, DESIGN 1
RS7	WHEEL - 17 X 6.5, J, ALUMINUM, DESIGN 1
RSR	OCCUPANT DETECT SYS - REAR SEAT, DOOR ACTIVATED

RPO	Description
RVG	ACCESSORY - ADAPTER - TRAILER HARNESS
RVQ	ACCESSORY - ASSIST STEPS - TUBULAR - OVAL - BLACK
RVS	ACCESSORY - ASSIST STEPS - TUBULAR - ROUND - BLACK
RW9	ACCESSORY - BED STORAGE BOX - SIDE FULL LENGTH - COMPOSITE
RWA	ACCESSORY - BED STORAGE BOX - FOAM
RWL	CHASSIS DRIVE LINE - REAR WHEEL DRIVE (RWD)
RWS	ACCESSORY - FLOOR MATS - CARPET
RXJ	ACCESSORY - CENTER CAP - WHEEL - DESIGN 2
RXQ	ACCESSORY - CONVENIENCE NET - BED MOUNTED
RY2	ACCESSORY - DECALS/APPLIQUES
RYT	ACCESSORY - FIRST AID KIT
S08	ACCESSORY - HIGHWAY SAFETY KIT
S0M	ACCESSORY - ILLUMINATED DOOR SILLS
S0T	ACCESSORY - INTERIOR TRIM KIT - ALTERNATE FINISH 1
S0Y	ACCESSORY - LAMPS - CARGO AREA
S1H	ACCESSORY - OFF-ROAD RECOVERY KIT
S1O	ACCESSORY - CONTAINER - LOCKABLE STORAGE - INTERIOR
S3I	ACCESSORY - LAMPS - PERIMETER ILLUMINATION
S41	ACCESSORY - LINER - WHEEL HOUSE
S47	ACCESSORY - LUG NUTS
S4W	ACCESSORY - LUG NUT AND WHEEL LOCK KIT DESIGN 2
S6L	ACCESSORY - PROTECTOR - ROCKER PANEL
S6N	ACCESSORY - RECEIVER COVER - TRAILER HITCH
S6P	ACCESSORY - REMOTE START KIT
S6Z	ACCESSORY - SEAT COVER - TAILORED - ALTERNATE MATERIAL
SAF	LOCK - SPARE TIRE, HOIST SHAFT
SAK	ACCESSORY - WHEEL - 22 X 8.5 - J - ALUMINUM DESIGN 1
SAM	ACCESSORY - SKID PLATES
SAX	ACCESSORY - SPEAKER KIT - LEVEL 1
SAY	ACCESSORY - WHEEL - 22 X 8.5 - J - ALUMINUM DESIGN 2
SB7	ACCESSORY - DECAL PACKAGE - DESIGN 1
SB9	ACCESSORY - DECAL PACKAGE - DESIGN 2

RPO	Description
SBL	ACCESSORY - WHEEL - 22 X 8.5 - J - ALUMINUM DESIGN 3
SBZ	ACCESSORY - SPORT PEDAL KIT
SD5	ACCESSORY - TIRE PRESSURE MONITOR
SDE	ACCESSORY - TRAILER HITCH - REMOVABLE
SDI	ACCESSORY - TRIANGLE - REFLECTIVE
SFE	ACCESSORY - WHEEL LOCKS
SFJ	ACCESSORY - WINDOW SHADES - REFLECTIVE
SFZ	ACCESSORY - EMBLEM - EXTERIOR - DESIGN 1
SHH	ACCESSORY - WHEEL - 20 X 8.5 - J - ALUMINUM - DESIGN 1
SIE	ACCESSORY - PUBX TIERED STORAGE
SJB	ACCESSORY - GRILLE / GRILLE INSERTS - ALTERNATE FINISH 3
SK1	WHEEL SPARE - 18 X 6.5, J, STEEL, DESIGN 1
SKP	WHEEL SPARE - 17 X 6.5, J, STEEL, DESIGN 1
SKX	ACCESSORY - WHEEL - 20 X 8.5 - J - ALUMINUM - DESIGN 7
SL7	ACCESSORY - PUBX LADDER / UTILITY RACK STANCHIONS
SNO	ACCESSORY - HITCH COMPLETION PKG - GOOSENECK
SNR	SEAT RR - SPLIT, FOLDING, DELUXE STORAGE
SPY	ACCESSORY - LUG NUTS - ALT FINISH
SPZ	ACCESSORY - WHEEL LOCKS - ALT FINISH
SQ9	ACCESSORY - WHEEL - 20 X 8.5 - J - ALUMINUM - DESIGN 8
SRI	WHEEL - 20 X 8.5 - J - ALUMINUM - DESIGN 21
SRW	CHASSIS - SINGLE REAR WHEEL, RIDE & HANDLING
SUR	ACCESSORY - TRAILER TIRE PRESSURE MONITOR
T3U	LAMP FRT FOG - FRT FOG
T4A	HEADLAMPS - HALOGEN
T4L	HEADLAMPS - LED
T4Z	SEAT BELT SAFETY SYS - SHIFTER INTERLOCK, GEN 1, NON-CUSTOMIZABLE
T8Z	SEAT BELT SAFETY SYS - SHIFTER INTERLOCK, GEN 3, INFOTAINMENT CUSTOMIZABLE
TDM	MODE DRIVER SETTINGS - TEEN DRIVER, INFOTAINMENT
TGH	HANDLE - ASSIST, PUBX

RPO	Description
TPU	ACCESSORY - CAMERA PKG - TRAILERING UPGRADE
TQ5	HEADLAMP HIGH BEAM - AUTO CONTROL
TRG	VISION TRAILER - INSIDE VIEW, REAR VIEW
TRO	ACCESSORY - CAMERA PKG - TRAILERING AUX MOUNTED
TUF	ORNAMENTATION - EMBLEM, "TEXAS EDITION"
U01	LAMP - FIVE, ROOF MARKER, TRUCK
U12	LAMP - EXTR, OSRV MIRROR, TASK
U2J	DIGITAL AUDIO SYSTEM - S-BAND - NONE
U2K	DIGITAL AUDIO SYSTEM - S-BAND
U73	ANTENNA - FIXED, RADIO
U95	SPEAKER SYSTEM - 2, BASE
UBC	RECPT USB ARMREST - DUAL, CHARGE, DATA
UBI	RECPT USB FLR CNSL R - DUAL, CHARGE
UBJ	RECPT USB IP LWR - DUAL, CHARGE, DATA
UD5	PARK ASSIST - FRONT AND REAR
UDC	DISPLAY INSTRUMENT - DRIVER INFO ENHANCED (ONE COLOR GRAPHIC)
UDU	PROVISIONS - REAR CAMERA PREP
UDV	DISPLAY INSTRUMENT - DRIVER INFO ENHANCED, FULL CLUSTER (MULTI COLOR GRAPHIC)
UE1	COMMUNICATION SYSTEM - VEHICLE, ONSTAR
UE4	SENSOR INDICATOR - FOLLOWING DISTANCE
UET	INDICATOR - SMART TRAILER INTEGRATION
UEU	SENSOR INDICATOR - FORWARD COLLISION ALERT
UF2	LAMP - CARGO
UF3	SWITCH - HIGH IDLE
UFG	REAR CROSS TRAFFIC - ALERT
UFL	LANE ACTIVE SAFETY - DEPARTURE WARNING
UG1	OPENER - GARAGE DOOR, UNIVERSAL
UGA	HOOK - TOW, RED
UH5	INDICATOR - SEAT BELT WARNING, REAR SEAT
UHY	COLL IMMINENT BRK - LOW SPEED, VEH FWD MOVEMENT, BRAKE PREFILL, INTEGRATED BRAKE ASSIST
UIR	INFOTAINMENT DISPLAY - NORMALLY BLACK COLOR (TFT), 7", WVGA 800X480P

RPO	Description
UJM	TIRE PRESS INDICATOR - MANUAL LEARN
UJN	TIRE PRESS INDICATOR - AUTO LEARN
UK3	CONTROL - STEERING WHEEL, ACCESSORY
UKC	SIDE ACTIVE SAFETY - OBSTACLE DETECTION ENHANCED
UKJ	PED DETECTION FRT - BASIC, PEDESTRIANS
UKV	SIDE ACTIVE SAFETY - OBSTACLE DETECTION ENHANCED, EXTENDED TRAILER VIEW
ULK	ACCESSORY - TOW HOOKS - RED
ULV	ACCESSORY - FLOOR LINER - CONTOURED - ALT DESIGN 2
ULV	BUMPER - RR, VAR 1
ULV	BUMPER FRT - SPORT
ULV	GATE TYPE - PUBX END ENHANCED
ULV	HEATER ENG - BLOCK
ULV	PLATE - FRT UNDERBODY, SKID
ULV	PLATE - SKID FRT
ULV	PLATE - SKID TRANSFER CASE
ULV	WHEEL - 18 X 9.0, J, ALUMINUM, DESIGN 3
ULV	WHEEL - 18 X 9.0, J, ALUMINUM, DESIGN 4
ULV	WHEEL SPARE - 18 X 9.0, J, ALUMINUM, DESIGN 1
ULV	WHEEL SPARE - 18 X 9.0, J, ALUMINUM, DESIGN 4
ULV	SALES PACKAGE - CHEVROLET BISON
UMN	SPEEDOMETER - INST, MILES & KILO, MILES ODOMETER
UQA	SPEAKER SYSTEM - PREMIUM AUDIO, BRANDED AMPLIFIER
UQF	SPEAKER SYSTEM - STANDARD AUDIO
URC	SWITCH - FLEXRIDE MODE SYSTEM
URD	INFOTAINMENT DISPLAY - NORMALLY BLACK COLOR (TFT) ,13.4", 2400X960
UTJ	THEFT DETERENT - ELECTRICAL, UNAUTHORIZED ENTRY
UV2	VISION - 360 VIEW, MONO, HD DIGITAL
UV6	HEAD UP DISPLAY - WINDSHIELD
UVB	VISION - REAR VIEW, MONO, HD DIGITAL
UVN	VISION AUXILIARY - CARGO BED
UVO	VISION AUXILIARY - CARGO BED BASE
UY2	WIRING PROVISIONS - CAMPER & 5TH WHEEL TRAILER
V46	BUMPER FRT - CHROME
V76	HOOK - TOW

RPO	Description
V8D	VEHICLE STATEMENT - VEHICLE LABEL CONTENT - U.S. FMVSS
VAV	ACCESSORY - FLOOR MATS - ALL WEATHER
VB5	BUMPER FRT - COLOR
VBJ	ACCESSORY - UNDERSEAT STORAGE
VBR	ACCESSORY - PUBX RUBBER MAT
VDA	ACCESSORY - CAMPER & 5TH WHEEL TRAILER CONNECTION
VGC	PROTECTOR - FILM, PAINT ETCH PREVENTIVE
VH6	BUMPER FRT - BLACK
VHU	BUMPER FRT - SPORT
VJG	BUMPER RR - BLACK
VJH	BUMPER RR - CHROME
VK3	LICENSE PLATE FRONT - FRT MOUNTING PKG
VKU	ACCESSORY - MIRROR CAPS - CHROME
VKY	ACCESSORY - DOOR HANDLES - ALTERNATE FINISH - CHROME
VLQ	HOOK - TOW, CHROME
VMK	ACCESSORY - CARGO MANAGEMENT SYSTEM RAILS
VOZ	ACCESSORY - TONNEAU - RR COMPT - HARD FOLDING - ALT DESIGN
VPB	ACCESSORY - TONNEAU - RR COMPT - VINYL W/ INTEGRAL CROSSBOW SUPPORTS
VQH	BUMPER - RR, VAR 1
VQK	ACCESSORY - SPLASH GUARDS - CUSTOM MOLDED
VQO	ACCESSORY - ASSIST STEPS - BLACK
VQY	ACCESSORY - TOW HOOKS - CHROME
VQZ	ACCESSORY - EXHAUST TIP - DESIGN 1
VST	ACCESSORY - SILL PLATES - ALTERNATE DESIGN 1
VSX	LABEL - TOWING
VT5	BUMPER RR - COLOR KEYED
VT7	OWNERS MANUAL - ENGLISH LANGUAGE
VTA	ACCESSORY - EXHAUST TIP - DESIGN 2
VTI	SHUTTERS - FRONT GRILLE, ACTIVE, UPR
VTP	ACCESSORY - ASSIST STEPS - COMMERCIAL
VV4	COMMUNICATION EQUIP - MOBILE INTERNET CONNECTIVITY
VW9	ACCESSORY - CENTER CAP - WHEEL - DESIGN 3
VXH	ACCESSORY - ASSIST STEPS - TUBULAR - CHROME - OVAL

RPO	Description
VXJ	ACCESSORY - ASSIST STEPS - TUBULAR - CHROME - ROUND
VXT	VEHICLE TYPE - INCOMPLETE
VXW	ACCESSORY - ASSIST STEPS - MOLDED
VYU	PROVISIONS - SNOW PLOW PREP
VZX	ACCESSORY - PUBX BEDLINER
W2D	ACCESSORY - CARGO NET
WBL	BUMPER FRT - COLOR
WBL	BUMPER RR - COLOR KEYED
WBL	EQUIPMENT - SUPPLIER INSTALLED
WBL	HANDLE O/S DOOR - CHROME
WBL	HEADLAMPS - LED
WBL	INDICATOR - SMART TRAILER INTEGRATION
WBL	LINER - PUBX, SPRAY ON
WBL	MIRROR PROVISIONS - HOUSING, CHROME
WBL	TIRE ALL - LT275/65R20 E 126/123 S BW AT VAR 1
WBL	VISION TRAILER - INSIDE VIEW, REAR VIEW
WBL	WHEEL - 20 X 8.5, J, ALUMINUM, DESIGN 25
WBL	WHEEL - 20 X 8.5, J, ALUMINUM, DESIGN 27
WBL	SALES PACKAGE - SPORT
WJP	ACCESSORY - WHEEL - 22 X 8.5 - J - ALUMINUM DESIGN 3
WJP	BUMPER FRT - COLOR
WJP	BUMPER RR - COLOR KEYED
WJP	HANDLE O/S DOOR - BODY COLOR
WJP	INDICATOR - SMART TRAILER INTEGRATION
WJP	MIRROR PROVISIONS - HOUSING, PAINTED
WJP	PRIMARY COLOR - EXTERIOR, BLACK (G) 8555
WJP	STEPS, RUNNINGBOARD - SIDE, RETRACTABLE, POWER, BLACK
WJP	TIRE ALL - LT265/60R22 E 123/120S BW AT VAR 1
WJP	TIRE ALL - LT275/65R20 E 126/123 S BW AT VAR 1
WJP	TIRE ALL - LT275/65R20 E 126/123 S BW OOR VAR 1
WJP	VISION TRAILER - INSIDE VIEW, REAR VIEW
WJP	WHEEL - 18 X 8.0, J, ALUMINUM, DESIGN 2
WJP	WHEEL - 20 X 8.5 - J - ALUMINUM - DESIGN 21

RPO	Description
WJP	SALES PACKAGE - MIDNIGHT EDITION
WLD	WINDOW CONTROL - REMOTE EXPRESS DOWN, ALL WINDOWS
WNO	VIN MODEL YEAR - 2026
WPC	CRUISE CONTROL - AUTOMATIC, ADAPTIVE, WITH STOP/GO
WPC	GATE FUNCTION - POWER
WPC	HEATER SEAT - REAR
WPC	OPENER - GARAGE DOOR, UNIVERSAL
WPC	WINDOW RR - FULL WIDTH, SLIDING, POWER
WPC	SALES PACKAGE - COMFORT AND CONVENIENCE
WPK	BUMPER FRT - COLOR
WPK	BUMPER RR - COLOR KEYED
WPK	EQUIPMENT - SUPPLIER INSTALLED
WPK	HANDLE O/S DOOR - BODY COLOR
WPK	HEADLAMPS - LED
WPK	HOOK - TOW, RED
WPK	INDICATOR - SMART TRAILER INTEGRATION
WPK	LINER - PUBX, SPRAY ON
WPK	MIRROR PROVISIONS - HOUSING, PAINTED
WPK	STEPS, RUNNINGBOARD - SIDE, RETRACTABLE, POWER, BLACK
WPK	TIRE ALL - LT265/60R22 E 123/120S BW AT VAR 1
WPK	TIRE ALL - LT275/65R20 E 126/123 S BW AT VAR 1
WPK	TIRE ALL - LT275/65R20 E 126/123 S BW OOR VAR 1
WPK	TIRE ALL - LT275/70R18 E 125/122 S BW AT VAR 1
WPK	VISION TRAILER - INSIDE VIEW, REAR VIEW
WPK	WHEEL - 18 X 8.0, J, ALUMINUM, DESIGN 2
WPK	WHEEL - 20 X 8.5 - J - ALUMINUM - DESIGN 21
WPK	SALES PACKAGE - SPORT PACK
WPQ	EQUIPMENT - SUPPLIER INSTALLED
WPQ	LINER - PUBX, SPRAY ON
WPQ	LINER - RR WHEELHOUSE
WPQ	SALES PACKAGE - PROTECTION
WR1	WHEEL - 20 X 8.5, J, ALUMINUM, DESIGN 26
WR4	WHEEL - 20 X 8.5, J, ALUMINUM, DESIGN 27
X31	BRK APL CTRL FEATURE - HILL DESCENT, GEAR HOLD

RPO	Description
X31	CHASSIS PACKAGE - "OFF ROAD"
X31	SALES PACKAGE - SKID PLATE, "OFF ROAD" SPORT
X31	TIRE ALL - LT265/70R17 E 121/118 Q BW AT
X31	TIRE ALL - LT275/65R20 E 126/123 S BW AT VAR 1
X31	TIRE ALL - LT275/70R18 E 125/122 S BW AT VAR 1
X88	MARKET BRAND - CHEVROLET
XGC	ACCESSORY TIRE - TIRE ALL-LT265/60R22 E 123/120S BW AT
XGD	TIRE ALL - LT265/60R22 E 123/120S BW AT VAR 1
YF5	CERTIFICATION - EMISSION, CALIFORNIA
Z6A	PROVISIONS - SPECIAL EQUIPMENT, 5TH WHEEL/ GOOSENECK TRAILER HITCH PREP PACKAGE
Z71	CHASSIS PACKAGE - "OFF ROAD"
Z82	TRAILER PROVISIONS - SPECIAL EQUIPMENT, H.D.
Z85	CHASSIS PACKAGE - INCREASED CAPACITY
ZAE	TIRE SPARE - LT235/80R18 E 121/118R BW AT
ZHQ	TIRE SPARE - LT245/75R17 E 121/118 R BW ALS
ZL3	ADJUSTER DRIVER SEAT - 8WAY, PWR RECLINE, PWR FORE/AFT, PWR HEIGHT, PWR TILT
ZL3	BRK APL CTRL FEATURE - INTEGRATED TRAILER BRAKE
ZL3	CHARGER - INDUCTIVE PORTABLE WIRELESS DEVICE
ZL3	CONSOLE - FRT COMPT, FLOOR, CUSTOM
ZL3	DEFOGGER - RR WINDOW, ELECTRIC
ZL3	GATE FUNCTION - MANUAL ASSIST POWER RELEASE
ZL3	GATE FUNCTION - POWER
ZL3	GATE TYPE - PUBX END ENHANCED
ZL3	GATE TYPE - PUBX END STANDARD
ZL3	HEATER - SEAT, VENTED, FRT
ZL3	HVAC SYSTEM - AIR CONDITIONER FRT, AUTO TEMP CONT, AUX TEMP CONT
ZL3	LAMP - CARGO
ZL3	LAMP - FIVE, ROOF MARKER, TRUCK
ZL3	LAMP FRT FOG - FRT FOG
ZL3	MIRROR O/S - LH & RH, ELEC REMOTE CONTROL, HEATER, MANUAL FOLD, FLAT/DRVR, FLAT/PASS

RPO	Description
ZL3	MIRROR O/S - LH&RH,WFOV,MAN EXT,PWR FLD,HTD,TURN SIG,R/CON,ELEC,AUX CARGO,AUX CLR,PERM LIGHT,FLAT LT SENS DR/PAS
ZL3	MIRROR O/S - MAN EXT, PWR ADJ, HEAT, MAN FOLD, TURN SIG, AUX CLR, FLAT DRVR/PASS, WFOV DRVR/PASS
ZL3	RECEPTACLE I/P - ELECTRICAL, 110 VOLT
ZL3	RECEPTACLE PUBX - ELECTRICAL, 110 VOLT
ZL3	RECPT USB ARMREST - DUAL, CHARGE, DATA
ZL3	RECPT USB FLR CNSL R - DUAL, CHARGE
ZL3	REMOTE START - VEHICLE
ZL3	SEAT - FRT BKT
ZL3	SPEAKER SYSTEM - PREMIUM AUDIO, BRANDED AMPLIFIER
ZL3	STEERING COLUMN - TILT, TELESCOPING
ZL3	WINDOW REG DRVR DR - POWER OPERATED, EXPRESS UP/DOWN
ZL3	WINDOW REG PASS DR - POWER OPERATED,EXPRESS DOWN
ZL3	WINDOW TYPE - PRIVACY
ZL3	SALES PACKAGE - CONVENIENCE
ZLQ	GATE FUNCTION - MANUAL ASSIST POWER RELEASE
ZLQ	MIRROR O/S - LH & RH, ELEC REMOTE CONTROL, HEATER, MANUAL FOLD, FLAT/DRVR, FLAT/PASS
ZLQ	MIRROR O/S - LH&RH,WFOV,MAN EXT,PWR FLD,HTD,TURN SIG,R/CON,ELEC,AUX CARGO,AUX CLR,PERM LIGHT,FLAT LT SENS DR/PAS
ZLQ	MIRROR O/S - MAN EXT, PWR ADJ, HEAT, MAN FOLD, TURN SIG, AUX CLR, FLAT DRVR/PASS, WFOV DRVR/PASS
ZLQ	WINDOW REG DRVR DR - POWER OPERATED, EXPRESS UP/DOWN
ZLQ	WINDOW REG PASS DR - POWER OPERATED,EXPRESS DOWN
ZLQ	SALES PACKAGE - LS FLEET
ZM9	HEATER SEAT FRT - DRVR & PASS
ZM9	STEERING WHEEL HEAT - AUTOMATIC
ZM9	SALES PACKAGE - COMFORT & CONVENIENCE
ZRX	CHASSIS PACKAGE - HIGH PERFORMANCE LIFTED
ZW9	BODY EQUIPMENT - BASE BODY OR CHASSIS
ZXT	TIRE SPARE - LT265/70R17/E BW TL

RPO	Description
ZYG	TIRE SPARE - LT275/70R18 E 125/122 S BW AT VAR 1
ZZT	TIRE SPARE - LT235/80R17 E 120/117 R BW AT

Section 1

Body Systems

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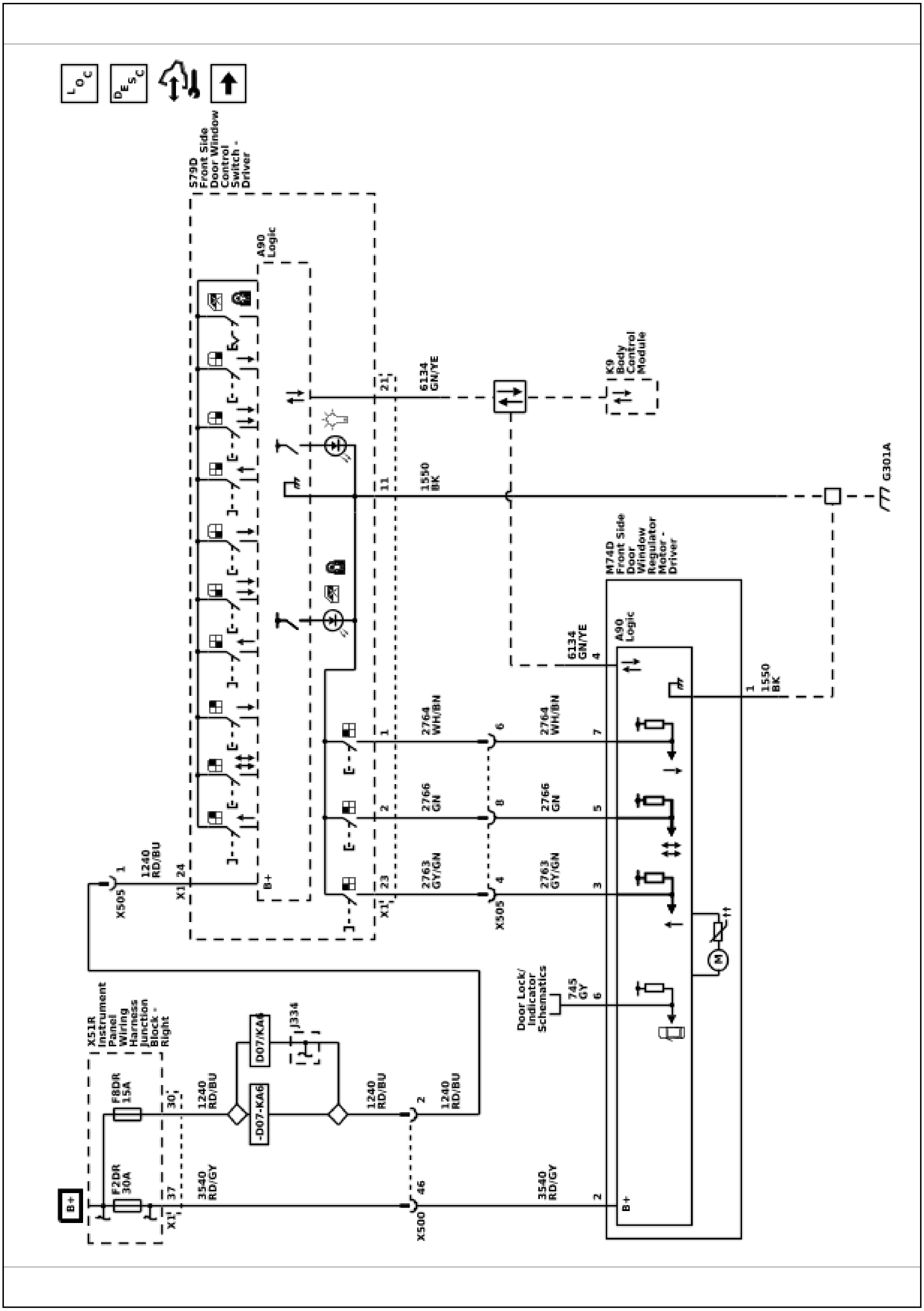
Body Systems

Fixed and Moveable Windows

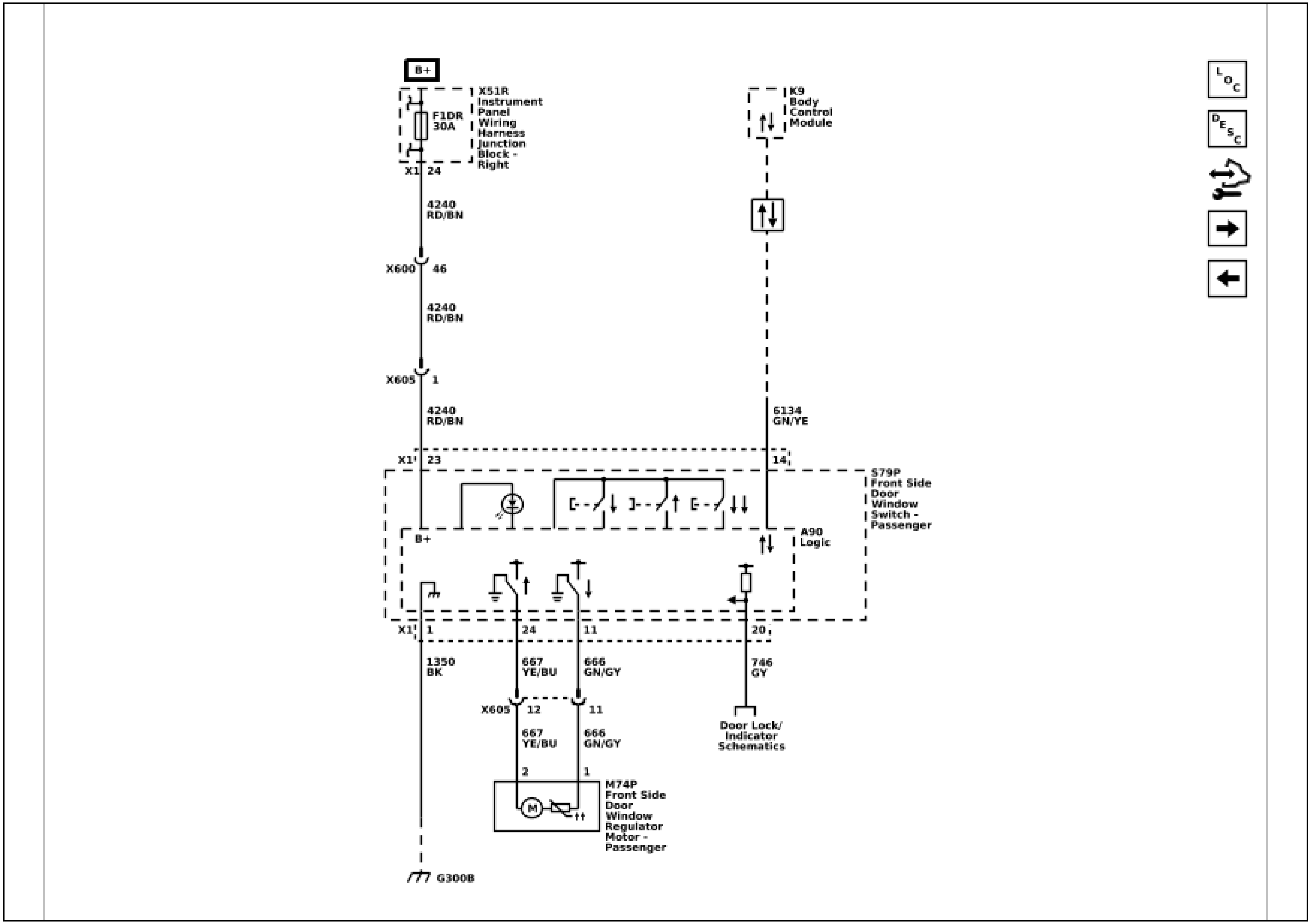
Schematic and Routing Diagrams

Moveable Window Schematics (Driver Window (AXG))


LOC
DESC
S79D Front Side Door Window Control Switch - Driver
A90 Logic
B+
X1
24
21
11
1
2
23
X505
1
1240 RD/BU
6134 GN/YE
1550 BK
2764 WH/BN
2766 GN
2763 GY/GN
K9 Body Control Module
G301A
6
8
4
M74D Front Side Door Window Regulator Motor - Driver
A90 Logic
6134 GN/YE
4
1550 BK
1
2764 WH/BN
7
2766 GN
5
2763 GY/GN
3
745 GY
6
Door Lock/ Indicator Schematics
3540 RD/GY
2
B+
M
X51R Instrument Panel Wiring Harness Junction Block - Right
F8DR 15A
F2DR 30A
30
37
X1
B+
1240 RD/BU
D07/KA6
-D07-KA6
J334
1240 RD/BU
2
1240 RD/BU
3540 RD/GY
X500
46

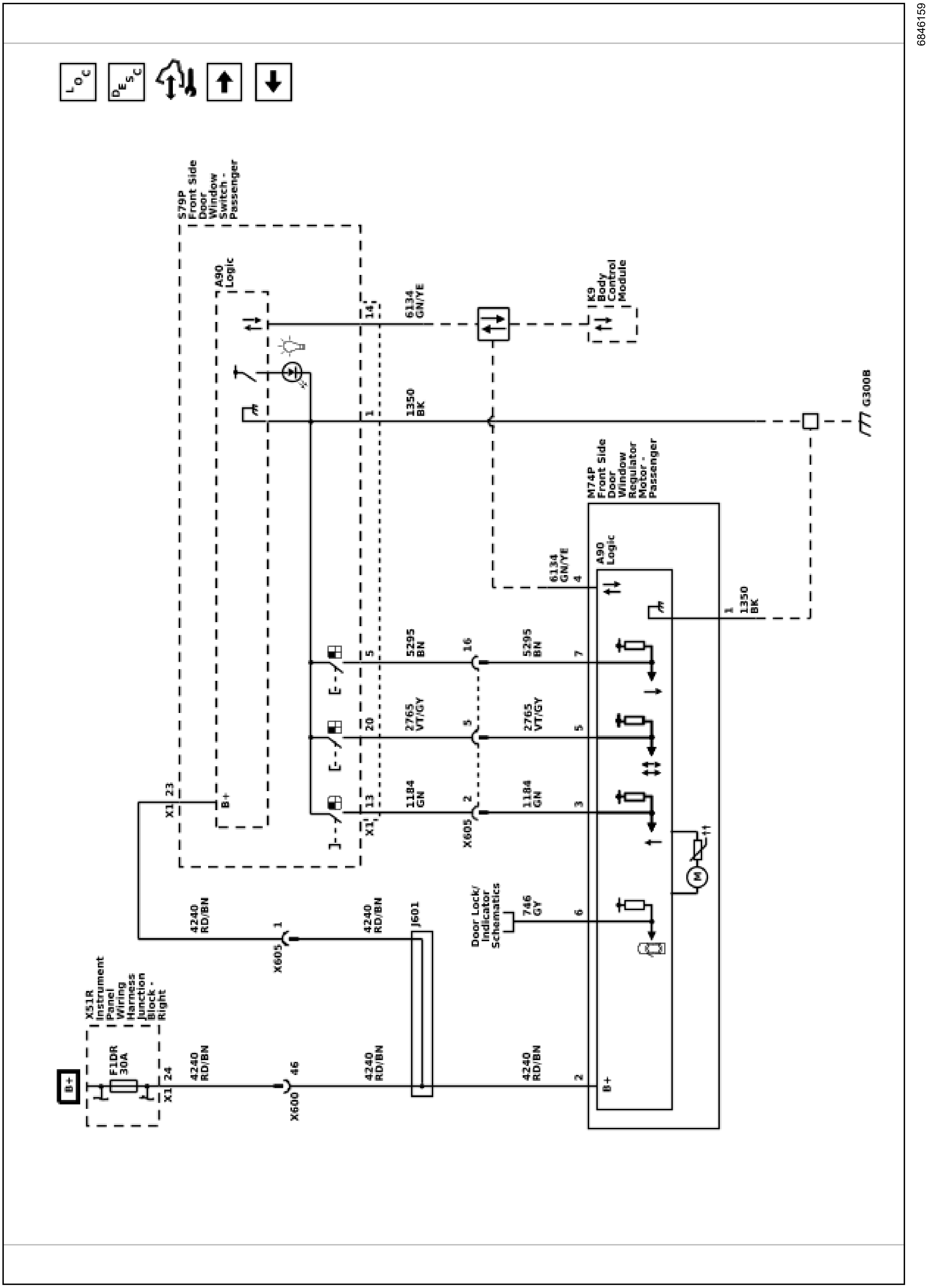
6846157

Moveable Window Schematics (Passenger Window (AED))

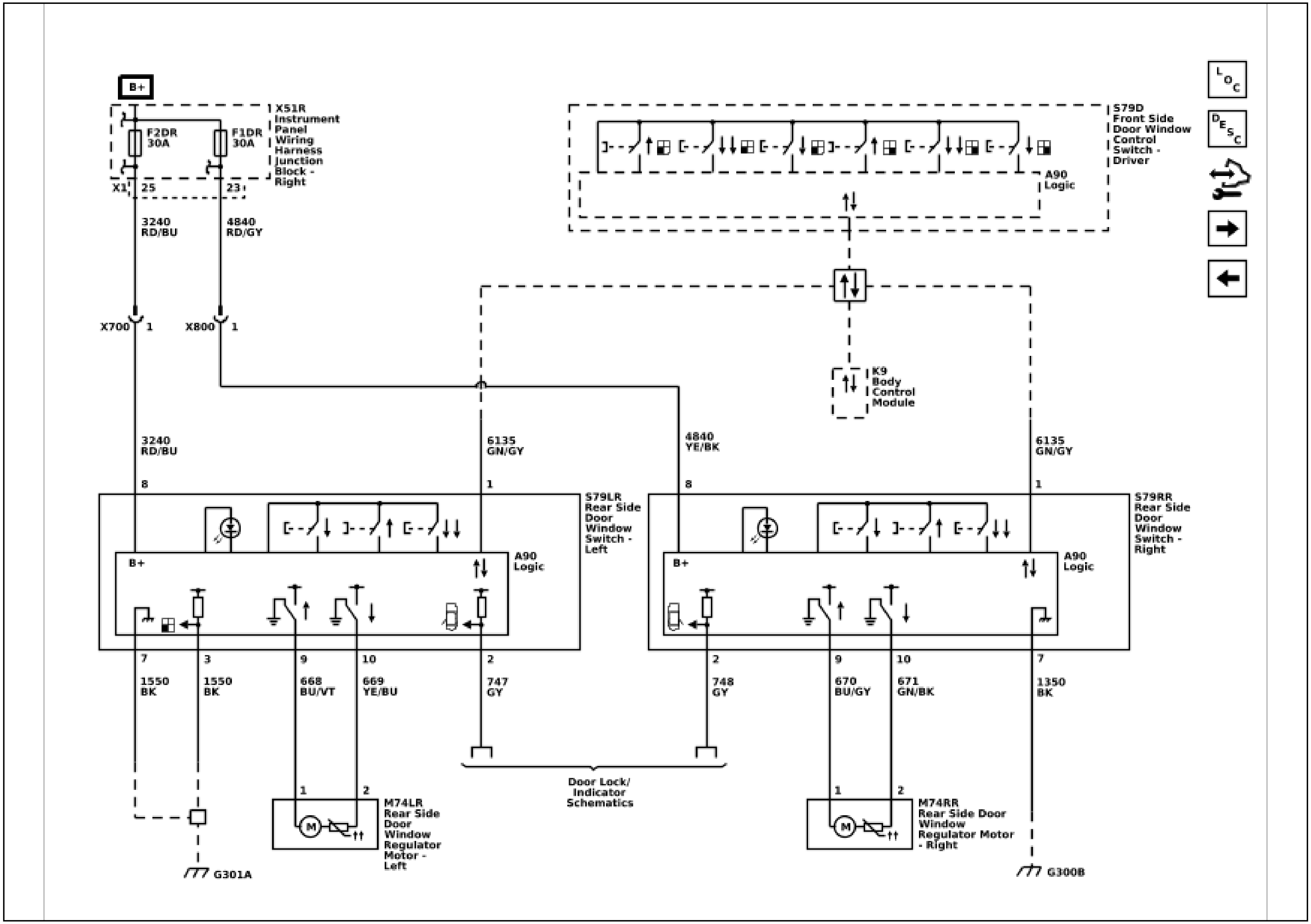

B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F1DR 30A
X1 24
4240 RD/BN
X600 46
4240 RD/BN
X605 1
4240 RD/BN
X1' 23
K9 Body Control Module
6134 GN/YE
14
S79P Front Side Door Window Switch - Passenger
A90 Logic
B+
X1' 1
24
11
20
1350 BK
667 YE/BU
666 GN/GY
746 GY
X605 12
11
667 YE/BU
666 GN/GY
2
1
M
M74P Front Side Door Window Regulator Motor - Passenger
Door Lock/ Indicator Schematics
G300B

6846158

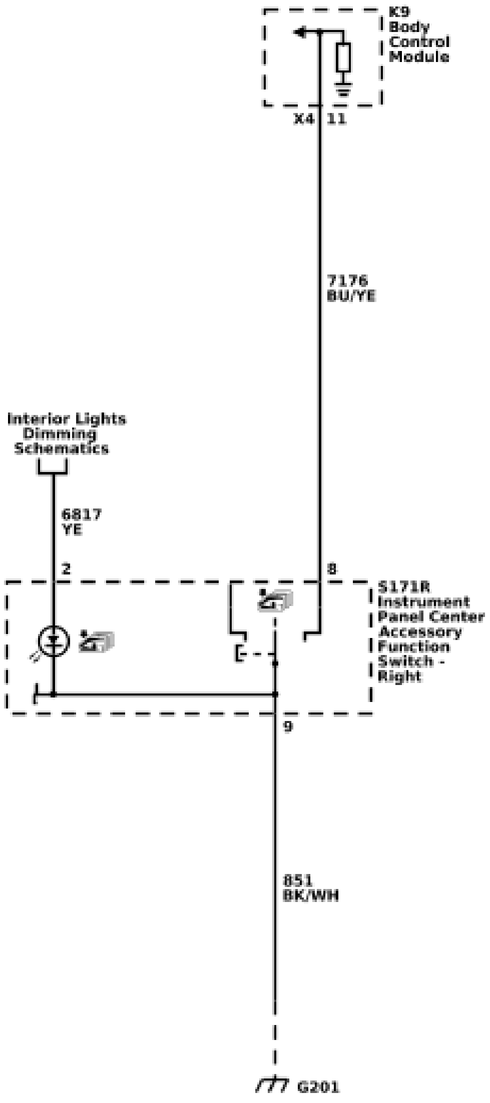
Moveable Window Schematics (Passenger Window (AEF))


6846159
LOC
DESC
S79P Front Side Door Window Switch - Passenger
A90 Logic
K9 Body Control Module
M74P Front Side Door Window Regulator Motor - Passenger
A90 Logic
G300B
X51R Instrument Panel Wiring Harness Junction Block - Right
B+
F1DR 30A
X1 24
X1 23
X1 14
X1 1
X1 5
X1 20
X1 13
B+
4240 RD/BN
X600 46
X605 1
X605 16
X605 5
X605 2
J601
6134 GN/YE
1350 BK
5295 BN
2765 VT/GY
1184 GN
746 GY
Door Lock/ Indicator Schematics
4
1
7
5
3
6
2
M

Moveable Window Schematics (Rear Windows (AEQ))

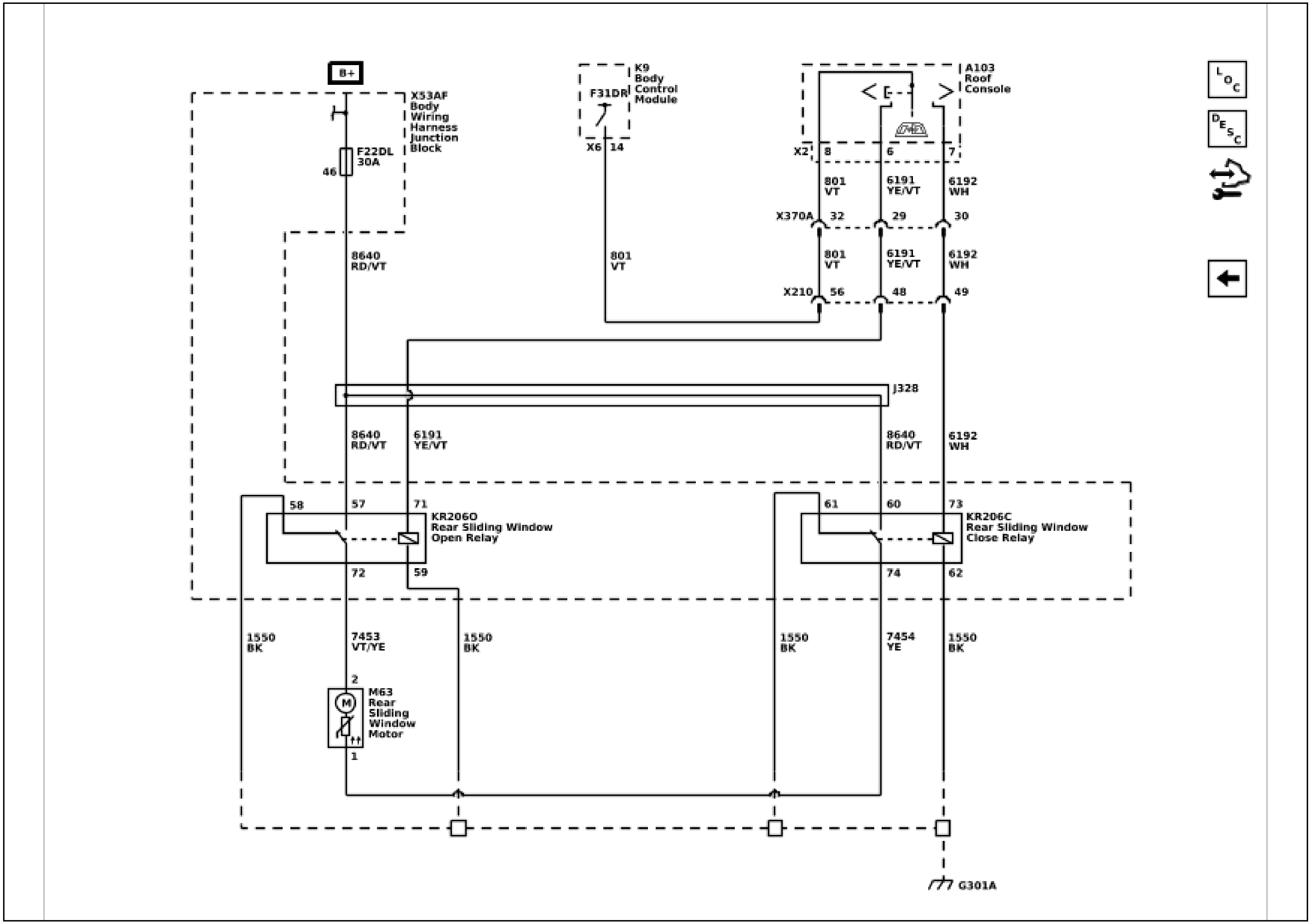

B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F2DR 30A
F1DR 30A
X1
25
23
3240 RD/BU
4840 RD/GY
X700
1
X800
1
S79D Front Side Door Window Control Switch - Driver
A90 Logic
K9 Body Control Module
3240 RD/BU
6135 GN/GY
4840 YE/BK
6135 GN/GY
8
1
8
1
S79LR Rear Side Door Window Switch - Left
A90 Logic
B+
S79RR Rear Side Door Window Switch - Right
A90 Logic
B+
7
3
9
10
2
2
9
10
7
1550 BK
1550 BK
668 BU/VT
669 YE/BU
747 GY
748 GY
670 BU/GY
671 GN/BK
1350 BK
Door Lock/ Indicator Schematics
1
2
M74LR Rear Side Door Window Regulator Motor - Left
M
1
2
M74RR Rear Side Door Window Regulator Motor - Right
M
G301A
G300B
LOC
DESC
6846160

Moveable Window Schematics (Global Window Express Down Switch - In Right IP Accessory Function Switch (WLD))


K9
Body
Control
Module
X4 11
7176
BU/YE
Interior Lights
Dimming
Schematics
6817
YE
2
8
S171R
Instrument
Panel Center
Accessory
Function
Switch -
Right
9
851
BK/WH
G201

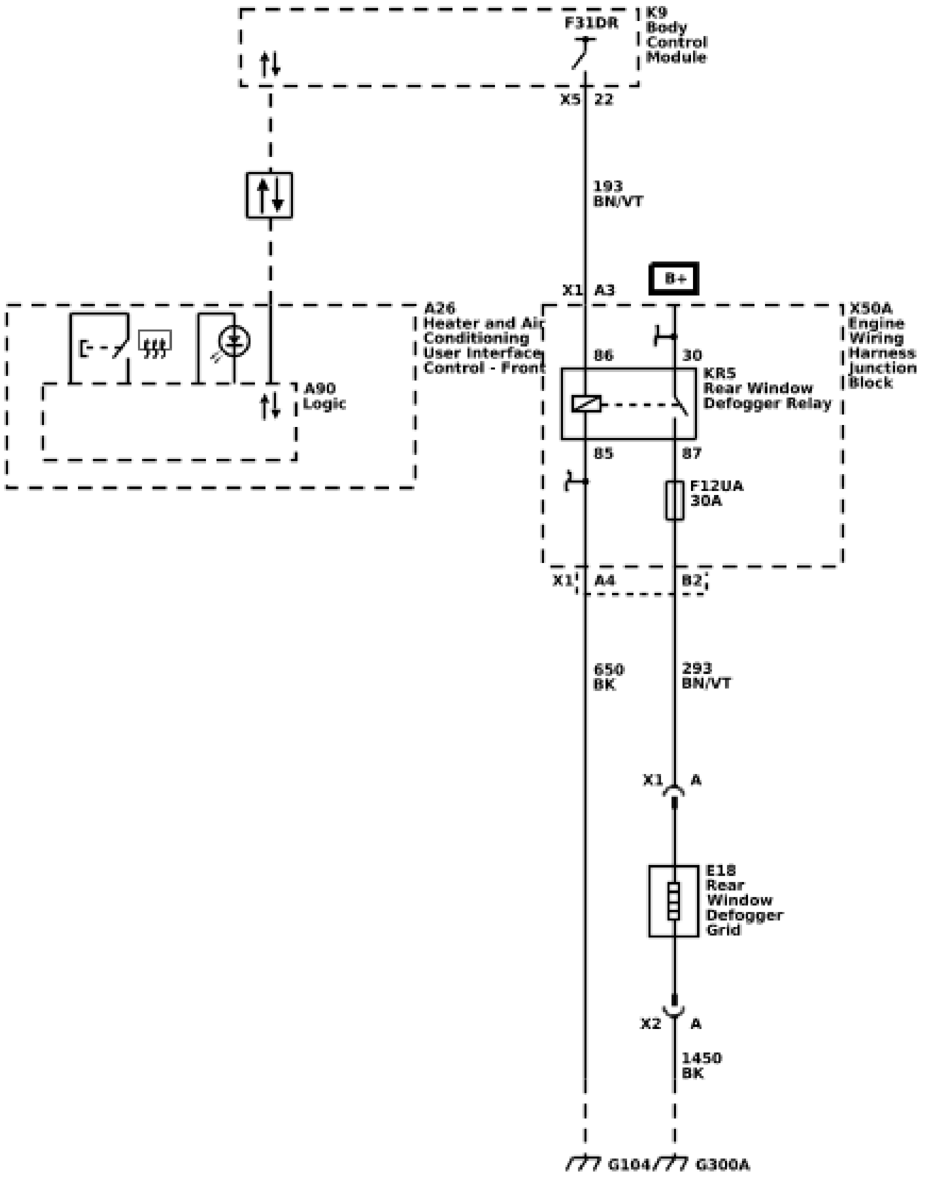
6846161

Moveable Window Schematics (Rear Sliding Window (A48))


B+
X53AF
Body
Wiring
Harness
Junction
Block
F22DL
30A
46
8640
RD/VT
K9
Body
Control
Module
F31DR
X6
14
801
VT
A103
Roof
Console
X2
8
6
7
801
VT
6191
YE/VT
6192
WH
X370A
32
29
30
801
VT
6191
YE/VT
6192
WH
X210
56
48
49
J328
8640
RD/VT
6191
YE/VT
8640
RD/VT
6192
WH
58
57
71
KR206O
Rear Sliding Window
Open Relay
72
59
61
60
73
KR206C
Rear Sliding Window
Close Relay
74
62
1550
BK
7453
VT/YE
1550
BK
1550
BK
7454
YE
1550
BK
2
M63
Rear
Sliding
Window
Motor
1
G301A

6846162

Defogger Schematics (Defogger)


K9
Body
Control
Module
F31DR
X5 22
193
BN/VT
B+
X1 A3
A26
Heater and Air
Conditioning
User Interface
Control - Front
A90
Logic
X50A
Engine
Wiring
Harness
Junction
Block
86
30
KR5
Rear Window
Defogger Relay
85
87
F12UA
30A
X1 A4
B2
650
BK
293
BN/VT
X1 A
E18
Rear
Window
Defogger
Grid
X2 A
1450
BK
G104
G300A

6846163

Description and Operation

Power Windows Description and Operation

Power Windows System Components

The power window system consists of the following components:

- Driver front side door window control switch
- Passenger front side door window control switch
- Left rear side door window switch
- Right rear side door window switch
- Window motors in each of the doors
- Body control module (BCM)

Driver and Passenger Express Up and Express Down Power Window Motors

The driver and passenger doors contain a smart window motor that will detect excessive resistance while performing the express up function and automatically reverse direction to prevent injury to any occupants that may become trapped between the closing window and the door frame. The automatic reverse safety feature can be overridden by pulling and holding the window switch.

The logic circuits within the window motor monitor the up, down and express signal circuits which are normally equal to B+ voltage. When a switch is used on the front side door window control switch, the contacts close causing a voltage drop within the appropriate signal circuit. The window motor will detect the voltage drop and will command the window to move in the direction requested.

The driver front side door window control switch communicates to the BCM by a serial data circuit. When the driver wishes to control the passenger window, the driver will use the appropriate switch on the driver front side door window control switch. When this switch is used, a serial data message is sent to the BCM requesting the passenger window motor command, the BCM will then send a serial data message to the passenger window motor which will then move in the direction requested.

Left Rear, Right Rear Express Down Window Motors

For the left rear and right rear doors, when their window switch is pressed in the down position, battery positive voltage is applied to their respective window motor control circuit and ground to the other window motor control circuit causing that window to open. When the individual window switch is pulled in the up position, voltage and ground is applied to the window motor in the opposite direction causing that window to close. The return path to ground is supplied through the inactive control circuit being normally grounded through the window switch.

Each rear side door window switch communicates to the BCM by a serial data circuit. When the driver wishes to control the left rear or right rear window, the driver will use the appropriate switch on the driver front side door window control switch. When this switch is used, a serial data message is sent to the BCM requesting a window motor command, the BCM will then send a serial data message to the appropriate rear side door window switch which will then command that window to move in the direction requested.

Lockout Switch Feature

The driver front side door window control switch contains a window lockout switch, when the driver presses the window lockout switch, a serial data message is sent to the BCM which will send a disable command to the rear side door window switches, deactivating them. The rear windows will still function normally from the switches on the driver front side door window control switch.

Rear Window Defogger Description and Operation

Rear Window Defogger System Components

The rear window defogger system consists of the following components:

- Body Control Module
- Front Heater and Air Conditioning User Interface Control
- Rear Body Wiring Harness Junction Block (Contains PCB Rear Defogger Relay
- Rear Defogger Grid
- 40A Fuse

Rear Window Defogger Operation

The rear defog control system utilizes a single zone backlight design, driven with a single relay configuration. A switch for the customer to control the system is provided within the front heater and air conditioning user interface control. Also included in the front heater and air conditioning user interface control is an indicator to inform the customer with the current state of the system. The system is only operational when engine is running or during remote start.

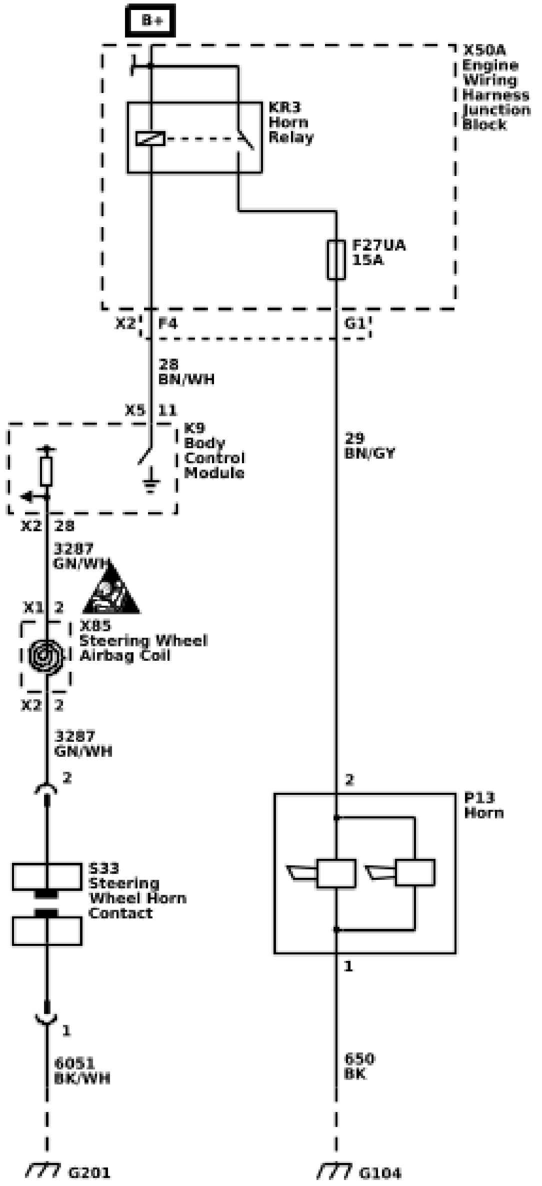
Pressing the heated rear window switch causes the front heater and air conditioning user interface control to send a serial data message to the body control module requesting rear window defog operation. The body control module upon receipt of the serial data message will provide voltage to the coil side of the rear defogger relay, this will energize the relay causing the relay switch contacts to close allowing B+ voltage to flow through the rear defogger grid control circuit to the rear defogger grid.

When the rear heated rear window switch is pressed and the engine is running, the rear window defogger grid will activate and will turn off automatically depending upon the vehicle speed (refer to owner’s manual for rear window defogger operation cycles)

Horns and Pedestrian Alerts

Schematic and Routing Diagrams

Horn Schematics (Horn)


B+
X50A
Engine
Wiring
Harness
Junction
Block
KR3
Horn
Relay
F27UA
15A
X2
F4
G1
28
BN/WH
X5
11
K9
Body
Control
Module
29
BN/GY
X2
28
3287
GN/WH
X1
2
X85
Steering Wheel
Airbag Coil
X2
2
3287
GN/WH
2
P13
Horn
2
1
S33
Steering
Wheel Horn
Contact
1
6051
BK/WH
650
BK
G201
G104

6846164

Description and Operation

Horns System Description and Operation

System Description

The horn system consists of the following components:

- HORN fuse
- Engine wiring harness junction block (contains horn PCB relay)
- Steering wheel horn contact
- Steering wheel airbag coil
- Horn
- Body control module (BCM)

System Operation

The vehicle horn system is activated under the following conditions:

- When the horn switch is depressed
- The BCM commands the horns ON under any of the following conditions:
    - When the content theft deterrent system detects a vehicle intrusion.
    - When the panic button is depressed on the remote control door lock transmitter—For further information refer to *Keyless Entry System Description and Operation 10-42*.
    - When the keyless entry system is used to lock the vehicle, a horn chirp may sound to notify the driver that the vehicle has been locked. The notification feature may be enabled or disabled through personalization. For further information refer to *Keyless Entry System Description and Operation 10-42*.
    - When the OnStar® system is used to sound the horns if equipped—For further information, refer to *OnStar Description and Operation 5-17*.

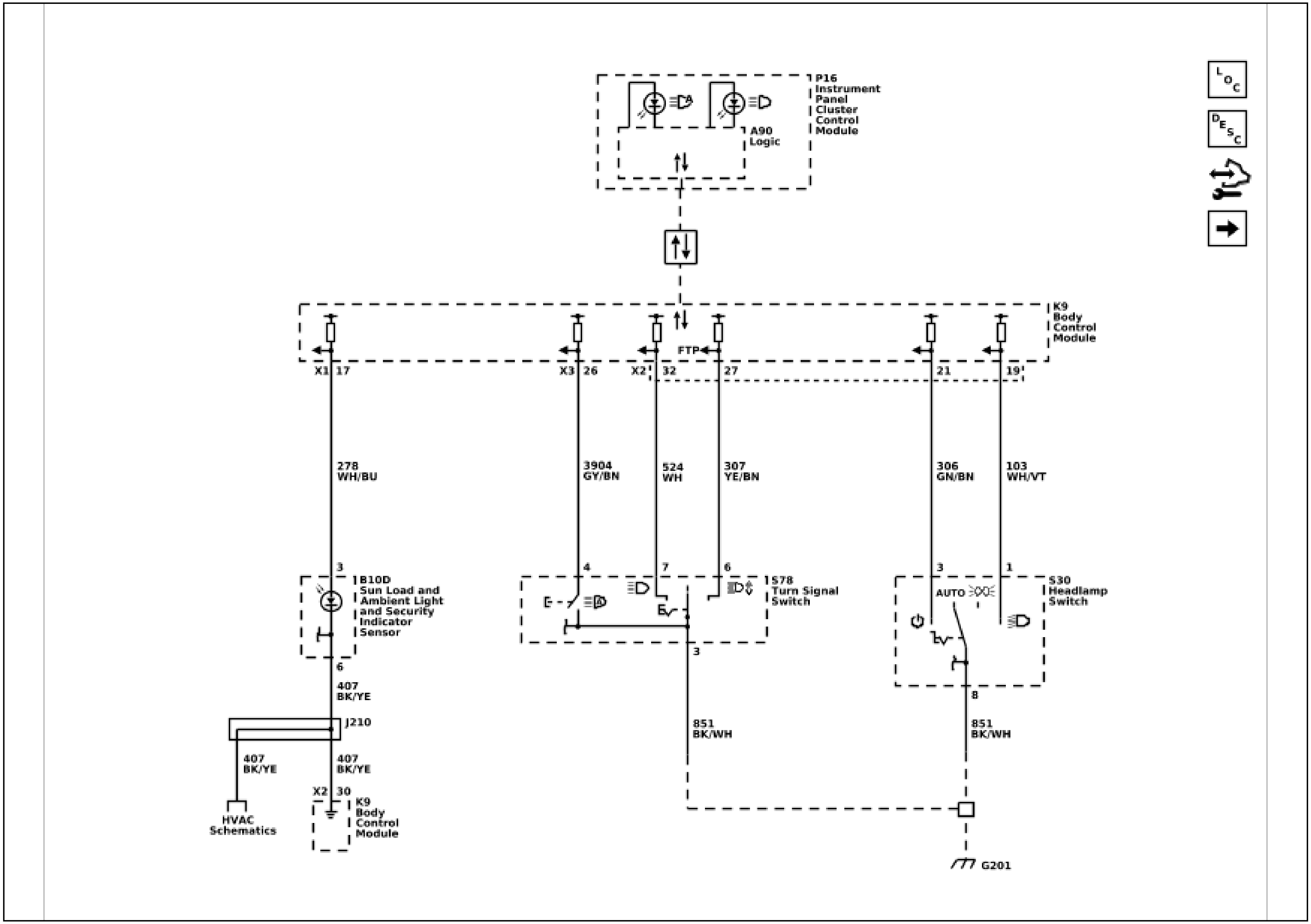
Circuit Operation

Battery positive voltage is applied at all times to the horn relay coil and the horn relay switch. Pressing either of the horn switches applies ground to the horn relay control circuit. The BCM may also apply ground to the horn relay control circuit as described above. When the horn relay control circuit is grounded, the horn relay is energized and battery positive voltage is applied to the horns through the horn control circuit. The horns sound as long as ground is applied to the horn relay control circuit.

Lighting

Schematic and Routing Diagrams

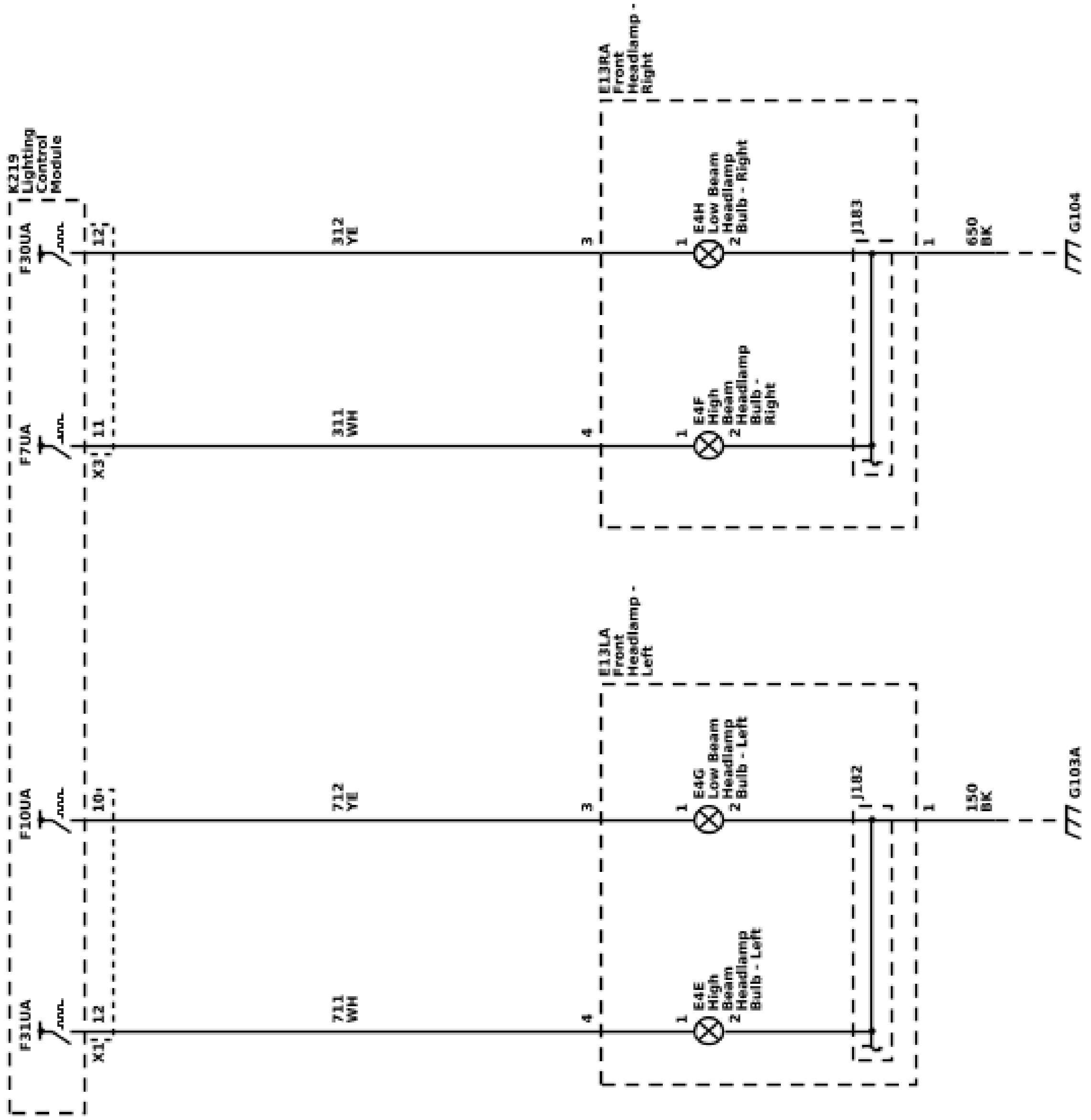
Headlights/Daytime Running Lights (DRL) Schematics (Controls and Indicators)


P16
Instrument
Panel
Cluster
Control
Module
A90
Logic
K9
Body
Control
Module
FTP
X1 17
X3 26
X2 32
27
21
19
278
WH/BU
3904
GY/BN
524
WH
307
YE/BN
306
GN/BN
103
WH/VT
3
B10D
Sun Load and
Ambient Light
and Security
Indicator
Sensor
6
407
BK/YE
J210
407
BK/YE
407
BK/YE
HVAC
Schematics
X2 30
K9
Body
Control
Module
4
7
6
S78
Turn Signal
Switch
3
851
BK/WH
3
1
S30
Headlamp
Switch
AUTO
8
851
BK/WH
G201

6846165

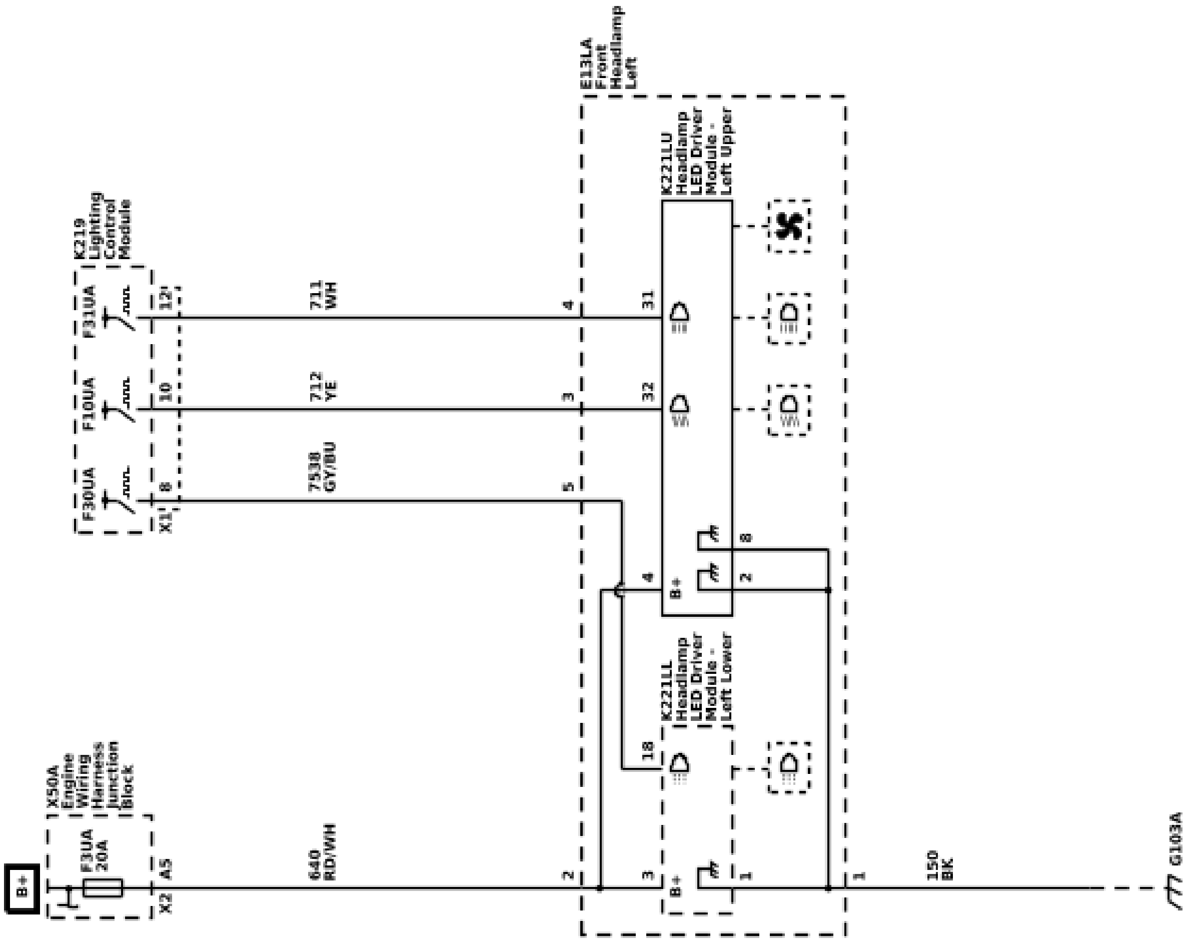
6846166

Headlights/Daytime Running Lights (DRL) Schematics (Headlamps (T4A))


K219 Lighting Control Module
F30UA
F7UA
F10UA
F31UA
X3
X1
12
11
10
12
312 YE
311 WH
712 YE
711 WH
E13RA Front Headlamp - Right
E13LA Front Headlamp - Left
3
4
3
4
1
2
E4H Low Beam Headlamp Bulb - Right
E4F High Beam Headlamp Bulb - Right
E4G Low Beam Headlamp Bulb - Left
E4E High Beam Headlamp Bulb - Left
J183
J182
1
650 BK
150 BK
G104
G103A

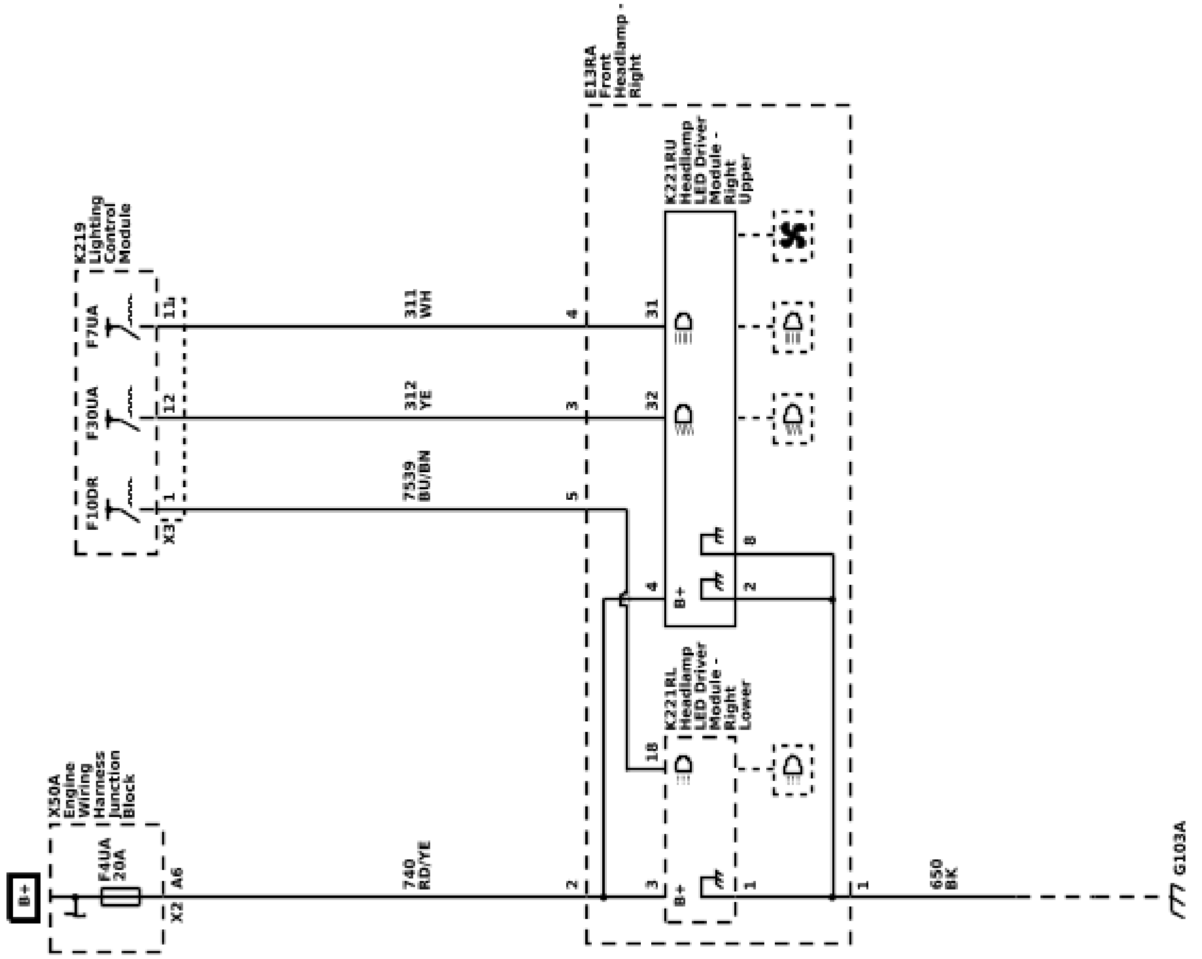
Headlights/Daytime Running Lights (DRL) Schematics (Headlamps and Daytime Running Lamps - Left (T4L))

6846167

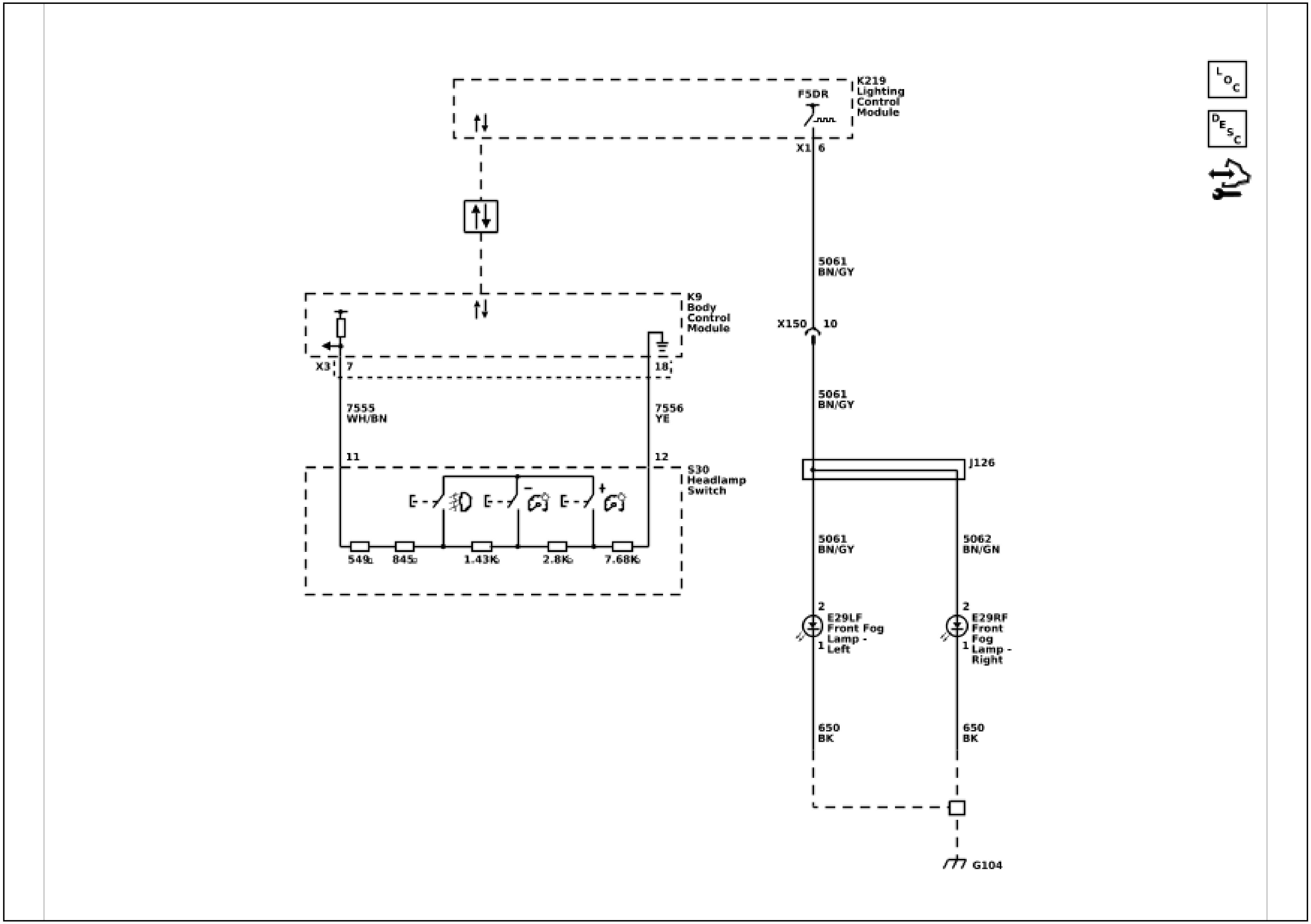

B+
X50A Engine Wiring Harness Junction Block
F3UA 20A
X2 A5
640 RD/WH
K219 Lighting Control Module
F30UA
F10UA
F31UA
X1 8
10
12
7538 GY/BU
712 YE
711 WH
E13LA Front Headlamp - Left
2
3
5
4
K221LU Headlamp LED Driver Module - Left Upper
31
32
4
B+
2
8
K221LL Headlamp LED Driver Module - Left Lower
18
3
B+
1
1
150 BK
G103A

6846168

Headlights/Daytime Running Lights (DRL) Schematics (Headlamps and Daytime Running Lamps - Right (T4L))

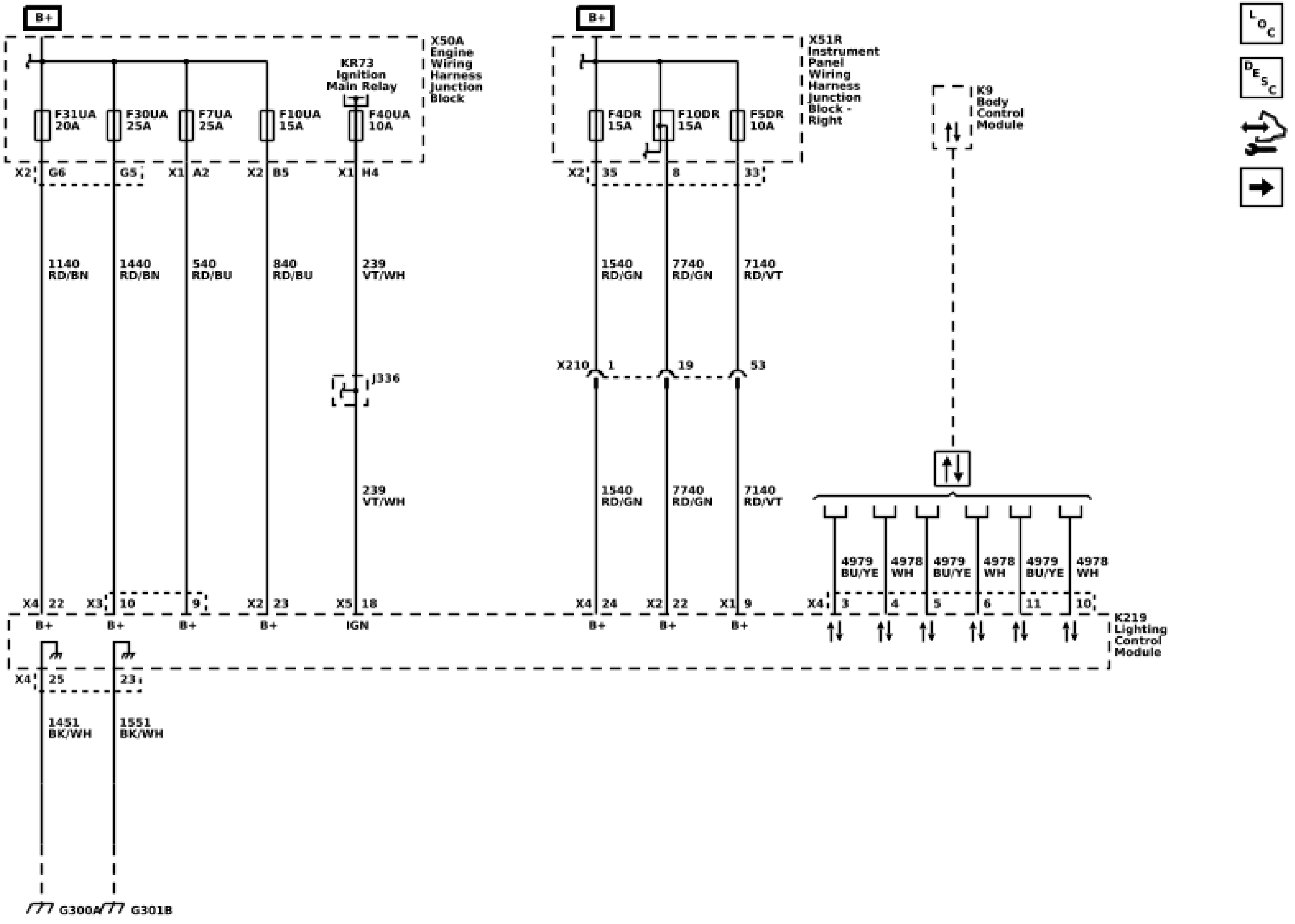

B+
X50A Engine Wiring Harness Junction Block
F4UA 20A
X2
A6
740 RD/YE
K219 Lighting Control Module
F10DR
F30UA
F7UA
X3
1
12
11
7539 BU/BN
312 YE
311 WH
E13RA Front Headlamp - Right
5
3
4
2
K221RU Headlamp LED Driver Module - Right Upper
31
32
4
B+
2
8
K221RL Headlamp LED Driver Module - Right Lower
18
3
B+
1
1
650 BK
G103A

Fog Lights Schematics (Fog Lamps (T3U))


K219
Lighting
Control
Module
F5DR
X1 6
5061
BN/GY
X150 10
5061
BN/GY
J126
5061
BN/GY
5062
BN/GN
2
E29LF
Front Fog
Lamp -
Left
1
2
E29RF
Front
Fog
Lamp -
Right
1
650
BK
650
BK
G104
K9
Body
Control
Module
X3 7
18
7555
WH/BN
7556
YE
11
12
S30
Headlamp
Switch
549Ω
845Ω
1.43KΩ
2.8KΩ
7.68KΩ
−
+

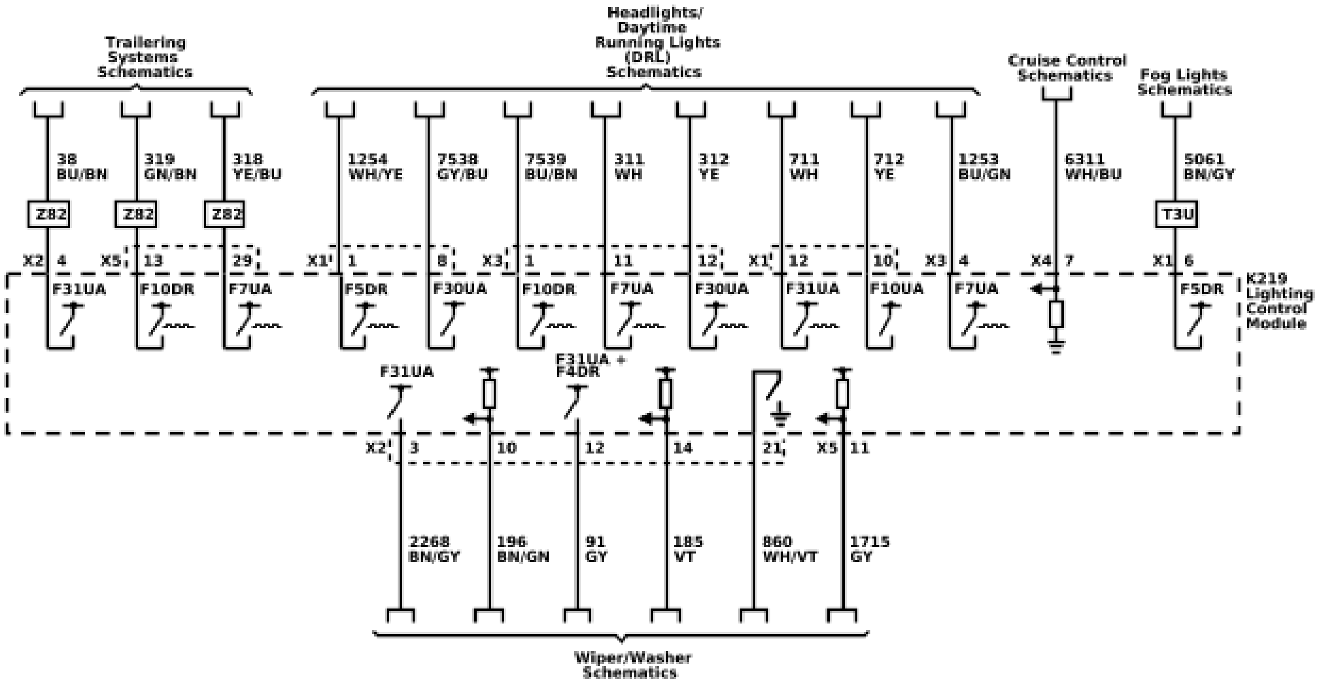
6846169

Exterior Lights Schematics (Lighting Control Module Power, Ground, and Serial Data)


B+
X50A Engine Wiring Harness Junction Block
F31UA 20A
F30UA 25A
F7UA 25A
F10UA 15A
KR73 Ignition Main Relay
F40UA 10A
X2 G6
G5
X1 A2
X2 B5
X1 H4
1140 RD/BN
1440 RD/BN
540 RD/BU
840 RD/BU
239 VT/WH
J336
239 VT/WH
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F4DR 15A
F10DR 15A
F5DR 10A
X2 35
8
33
1540 RD/GN
7740 RD/GN
7140 RD/VT
X210 1
19
53
1540 RD/GN
7740 RD/GN
7140 RD/VT
K9 Body Control Module
4979 BU/YE
4978 WH
4979 BU/YE
4978 WH
4979 BU/YE
4978 WH
X4 22
X3 10
9
X2 23
X5 18
X4 24
X2 22
X1 9
X4 3
4
5
6
11
10
B+
B+
B+
B+
IGN
B+
B+
B+
K219 Lighting Control Module
X4 25
23
1451 BK/WH
1551 BK/WH
G300A
G301B

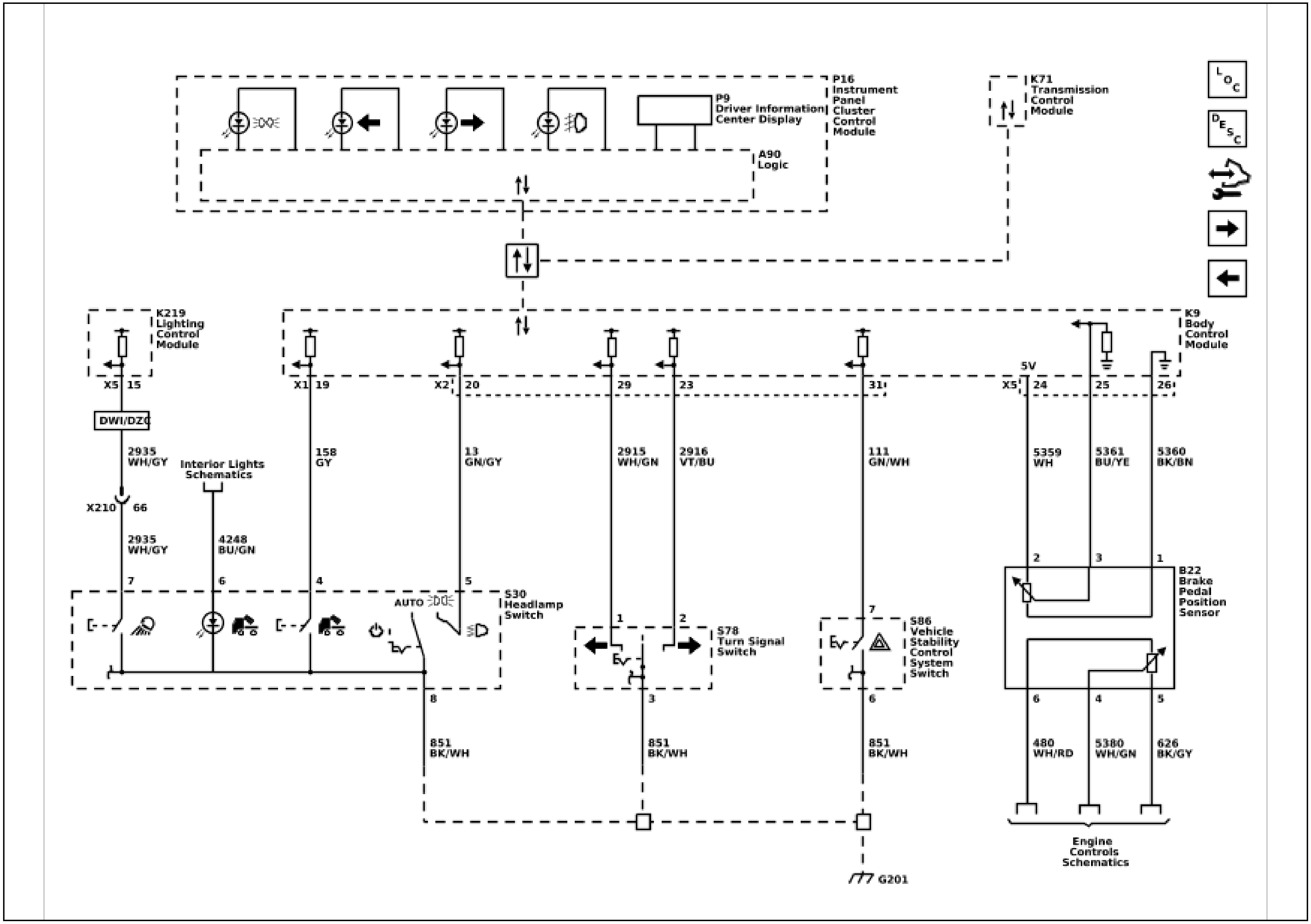
6846170

Exterior Lights Schematics (Lighting Control Module Subsystem References)

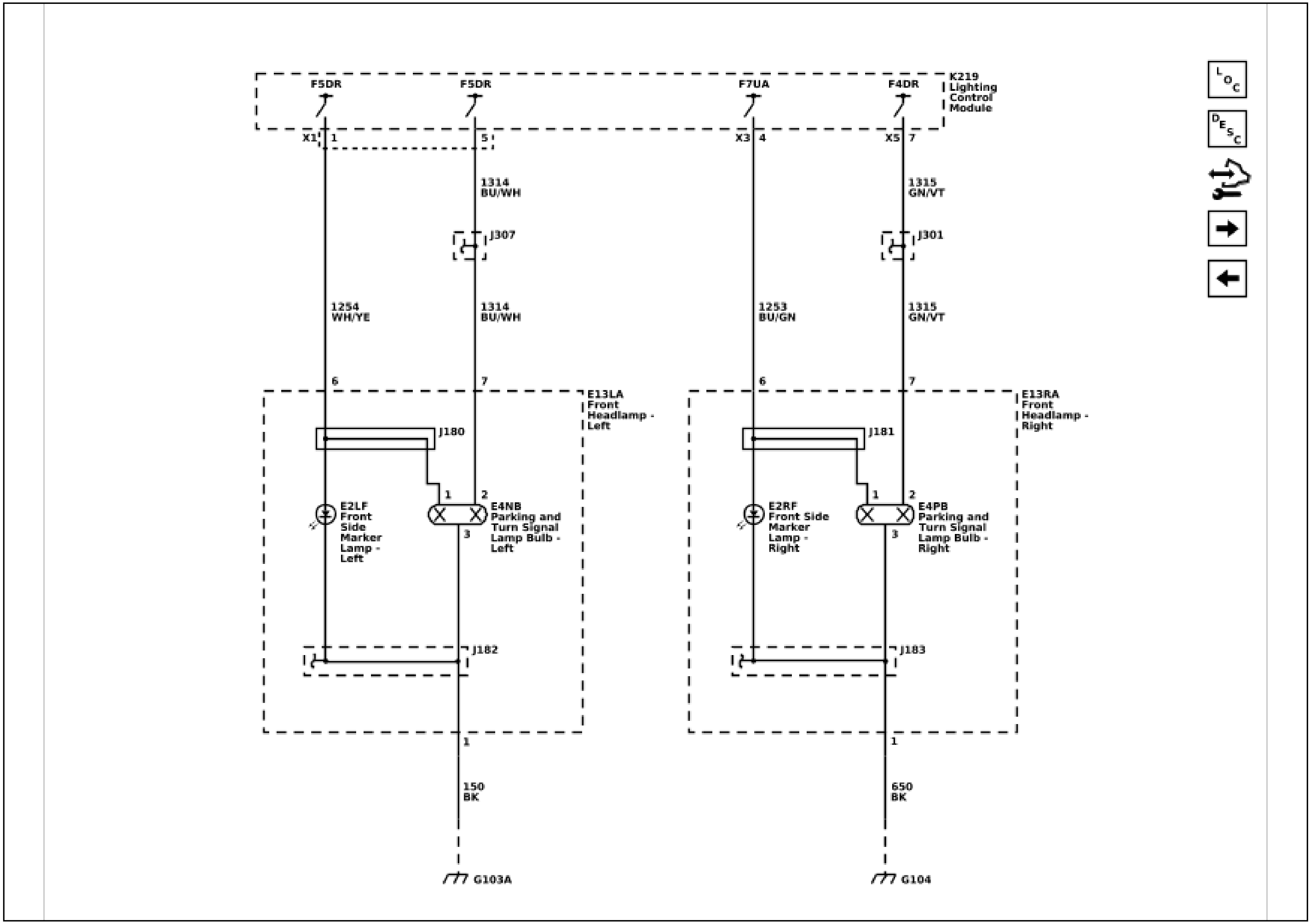

Trailering Systems Schematics
Headlights/ Daytime Running Lights (DRL) Schematics
Cruise Control Schematics
Fog Lights Schematics
38 BU/BN
319 GN/BN
318 YE/BU
1254 WH/YE
7538 GY/BU
7539 BU/BN
311 WH
312 YE
711 WH
712 YE
1253 BU/GN
6311 WH/BU
5061 BN/GY
Z82
Z82
Z82
T3U
X2 4
X5 13
29
X1 1
8
X3 1
11
12
X1 12
10
X3 4
X4 7
X1 6
F31UA
F10DR
F7UA
F5DR
F30UA
F10DR
F7UA
F30UA
F31UA
F10UA
F7UA
F5DR
K219 Lighting Control Module
F31UA
F31UA + F4DR
X2 3
10
12
14
21
X5 11
2268 BN/GY
196 BN/GN
91 GY
185 VT
860 WH/VT
1715 GY
Wiper/Washer Schematics

6846171

Exterior Lights Schematics (Controls and Indictors)

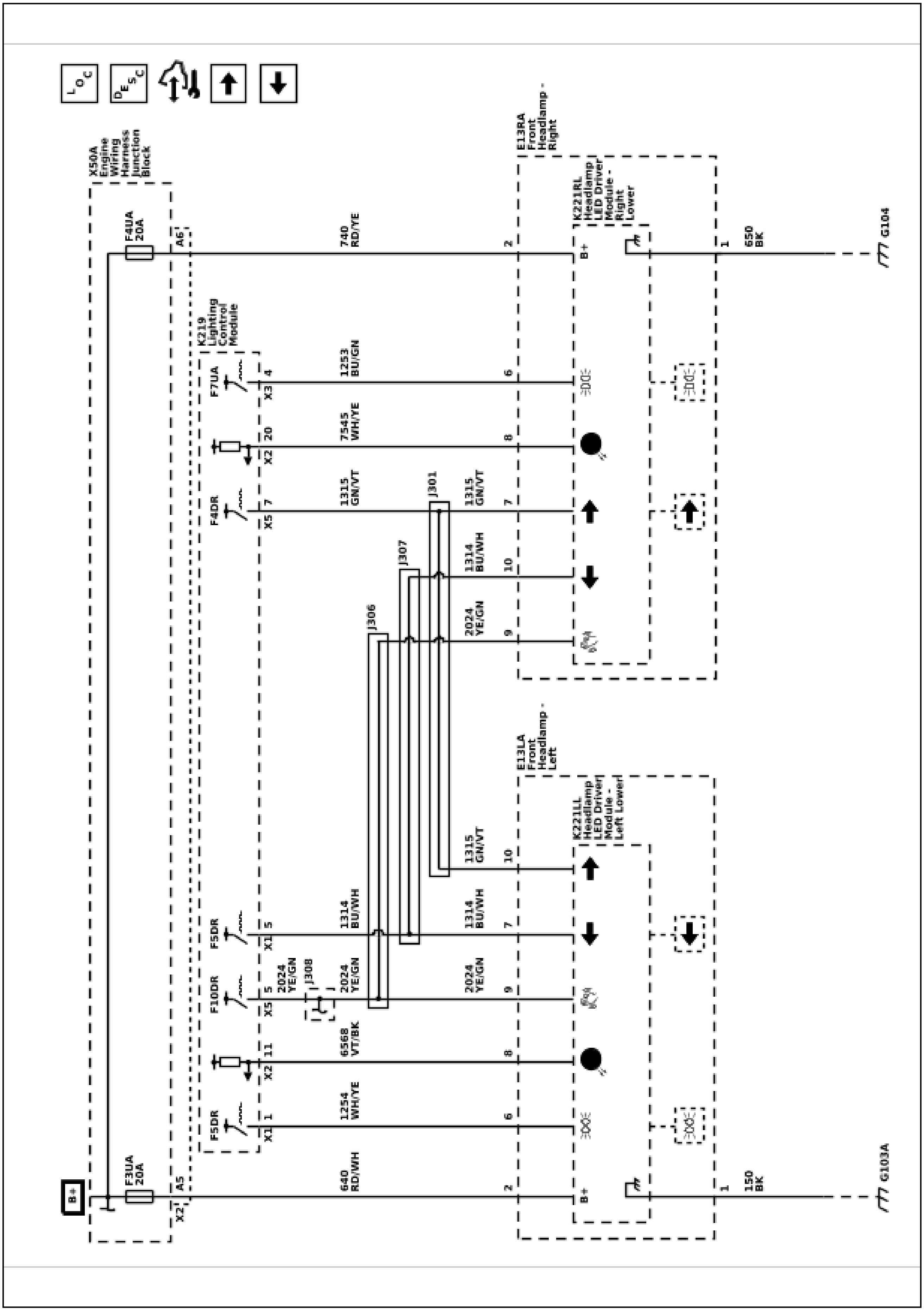

P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
K71 Transmission Control Module
K219 Lighting Control Module
K9 Body Control Module
X5 15
X1 19
X2 20
29
23
31
5V
X5 24
25
26
DWI/DZC
2935 WH/GY
X210 66
2935 WH/GY
Interior Lights Schematics
4248 BU/GN
158 GY
13 GN/GY
2915 WH/GN
2916 VT/BU
111 GN/WH
5359 WH
5361 BU/YE
5360 BK/BN
7
6
4
5
AUTO
S30 Headlamp Switch
1
2
S78 Turn Signal Switch
7
S86 Vehicle Stability Control System Switch
2
3
1
B22 Brake Pedal Position Sensor
8
3
6
6
4
5
851 BK/WH
851 BK/WH
851 BK/WH
480 WH/RD
5380 WH/GN
626 BK/GY
Engine Controls Schematics
G201
6846172

Exterior Lights Schematics (Front Turn Signals, Park Lamps, and Side Marker Lamps (T4A))

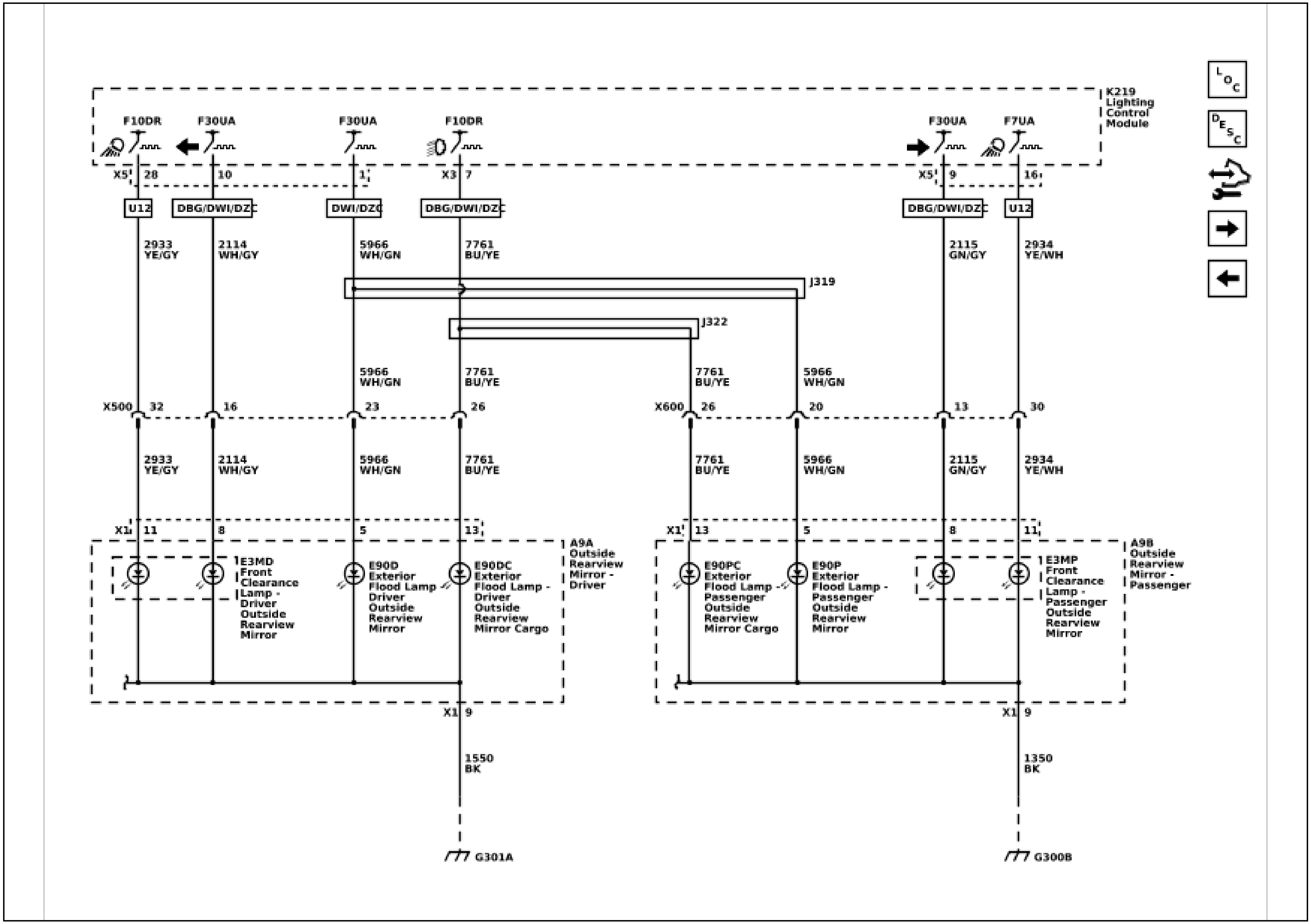

K219 Lighting Control Module
F5DR
F5DR
F7UA
F4DR
X1 1
5
X3 4
X5 7
1314 BU/WH
1315 GN/VT
J307
J301
1254 WH/YE
1314 BU/WH
1253 BU/GN
1315 GN/VT
6
7
6
7
E13LA Front Headlamp - Left
E13RA Front Headlamp - Right
J180
J181
1
2
E2LF Front Side Marker Lamp - Left
E4NB Parking and Turn Signal Lamp Bulb - Left
3
E2RF Front Side Marker Lamp - Right
E4PB Parking and Turn Signal Lamp Bulb - Right
J182
J183
1
150 BK
650 BK
G103A
G104

6846173

Exterior Lights Schematics (Front Turn Signals, Park Lamps, and Side Marker Lamps (T4L))

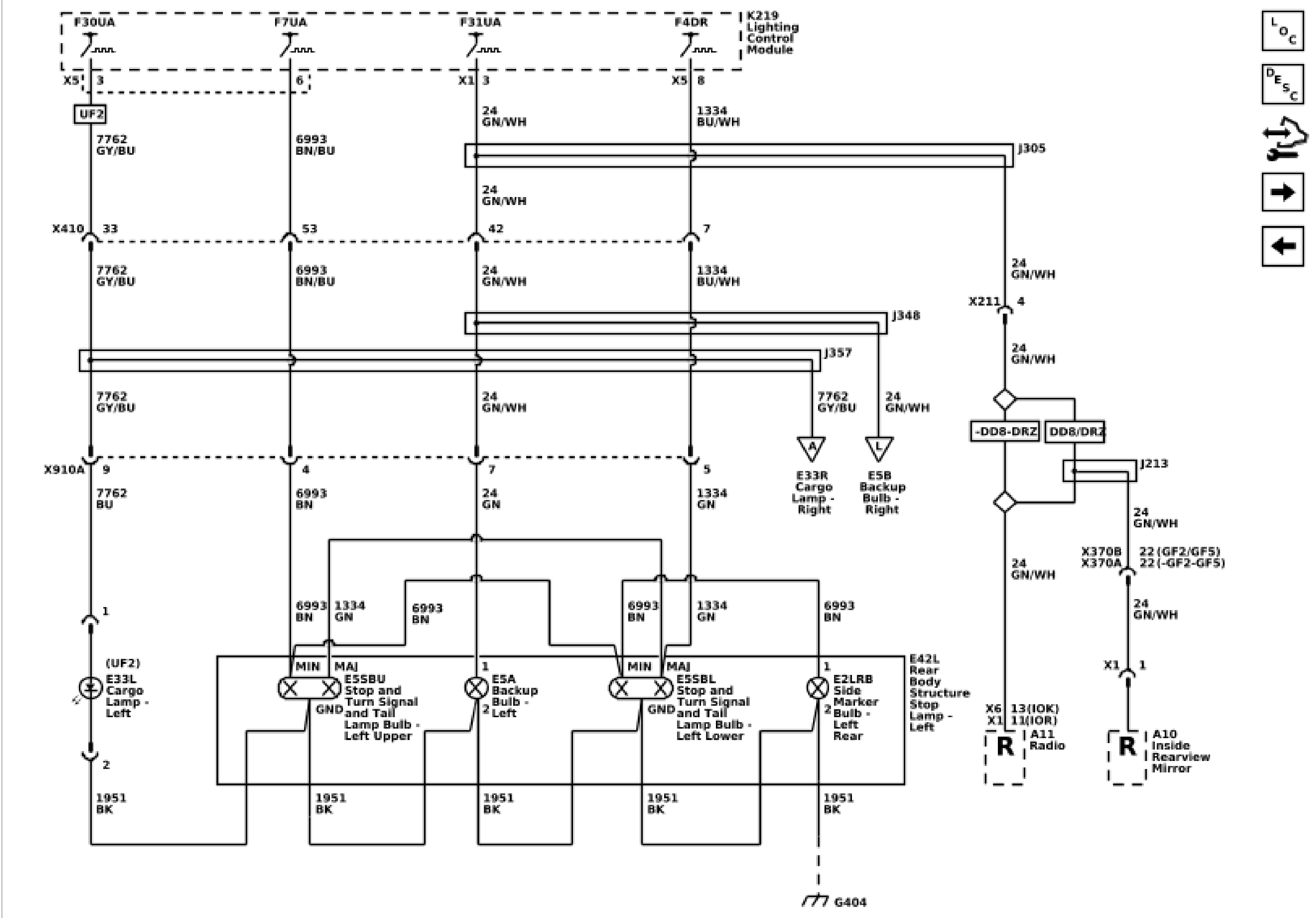

6846174
X50A Engine Wiring Harness Junction Block
F4UA 20A
A6
740 RD/YE
2
B+
E13RA Front Headlamp - Right
K221RL Headlamp LED Driver Module - Right Lower
1
650 BK
G104
K219 Lighting Control Module
F7UA
X3 4
1253 BU/GN
6
X2 20
7545 WH/YE
8
F4DR
X5 7
1315 GN/VT
J301
1315 GN/VT
7
J307
1314 BU/WH
10
J306
2024 YE/GN
9
E13LA Front Headlamp - Left
K221LL Headlamp LED Driver Module - Left Lower
1315 GN/VT
10
F5DR
X1 5
1314 BU/WH
1314 BU/WH
7
F10DR
X5 5
2024 YE/GN
J308
2024 YE/GN
2024 YE/GN
9
X2 11
6568 VT/BK
8
F5DR
X1 1
1254 WH/YE
6
B+
F3UA 20A
X2 A5
640 RD/WH
2
B+
1
150 BK
G103A

Exterior Lights Schematics (Outside Rearview Mirror Task, Turn, Approach, and Flood Lights (DWI / DLF / DZC))

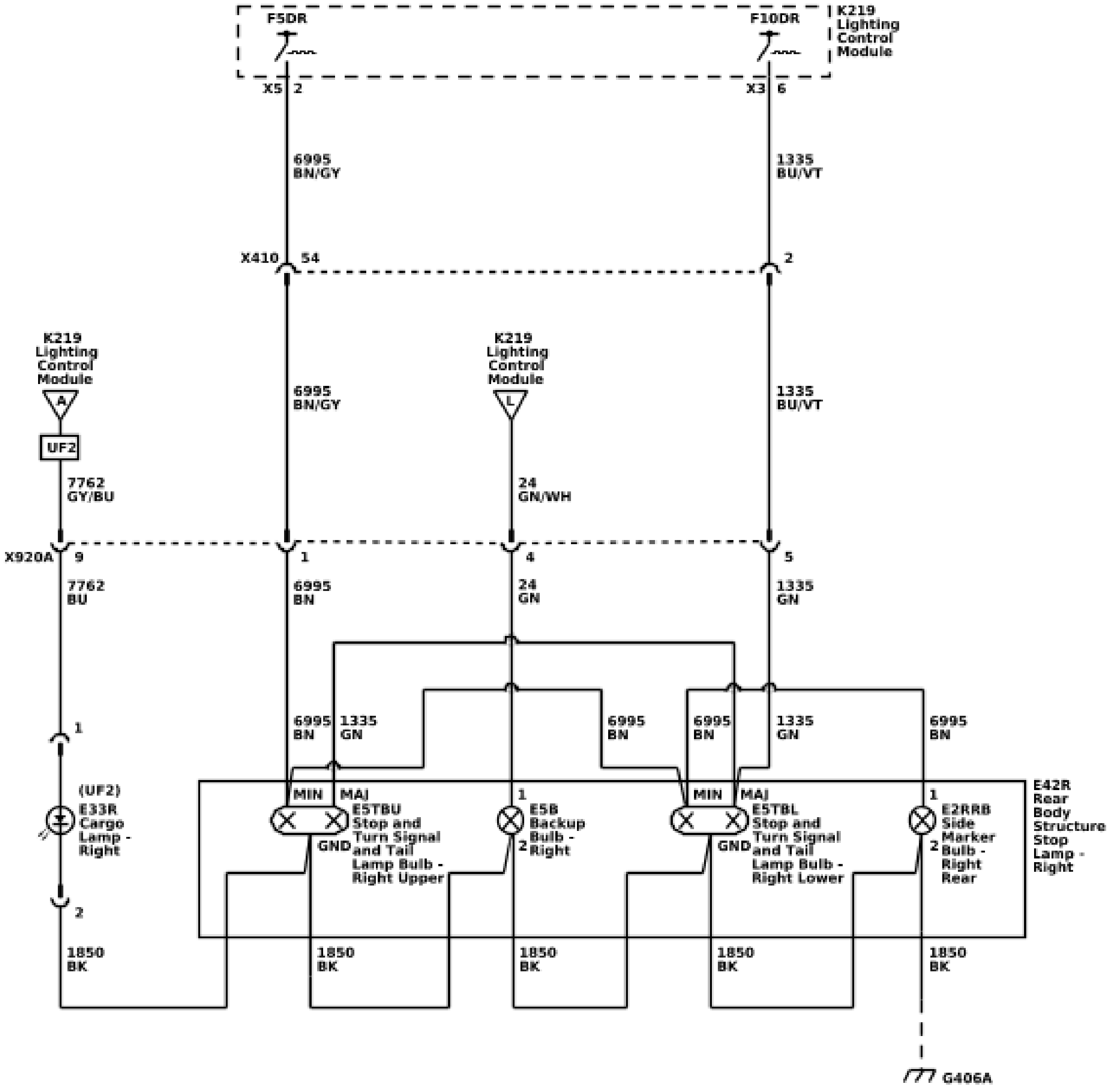

K219 Lighting Control Module
F10DR
F30UA
F30UA
F10DR
F30UA
F7UA
X5 28
10
1
X3 7
X5 9
16
U12
DBG/DWI/DZC
DWI/DZC
DBG/DWI/DZC
DBG/DWI/DZC
U12
2933 YE/GY
2114 WH/GY
5966 WH/GN
7761 BU/YE
2115 GN/GY
2934 YE/WH
J319
J322
7761 BU/YE
5966 WH/GN
X500 32
16
23
26
X600 26
20
13
30
X1 11
8
5
13
X1 13
5
8
11
E3MD Front Clearance Lamp - Driver Outside Rearview Mirror
E90D Exterior Flood Lamp Driver Outside Rearview Mirror
E90DC Exterior Flood Lamp - Driver Outside Rearview Mirror Cargo
A9A Outside Rearview Mirror - Driver
E90PC Exterior Flood Lamp - Passenger Outside Rearview Mirror Cargo
E90P Exterior Flood Lamp - Passenger Outside Rearview Mirror
E3MP Front Clearance Lamp - Passenger Outside Rearview Mirror
A9B Outside Rearview Mirror - Passenger
X1 9
X1 9
1550 BK
1350 BK
G301A
G300B
LOC
DESC

6846175

Exterior Lights Schematics (Tail Lamp Assembly - Left ((GF2 / GF3 / GF5) & SRW))

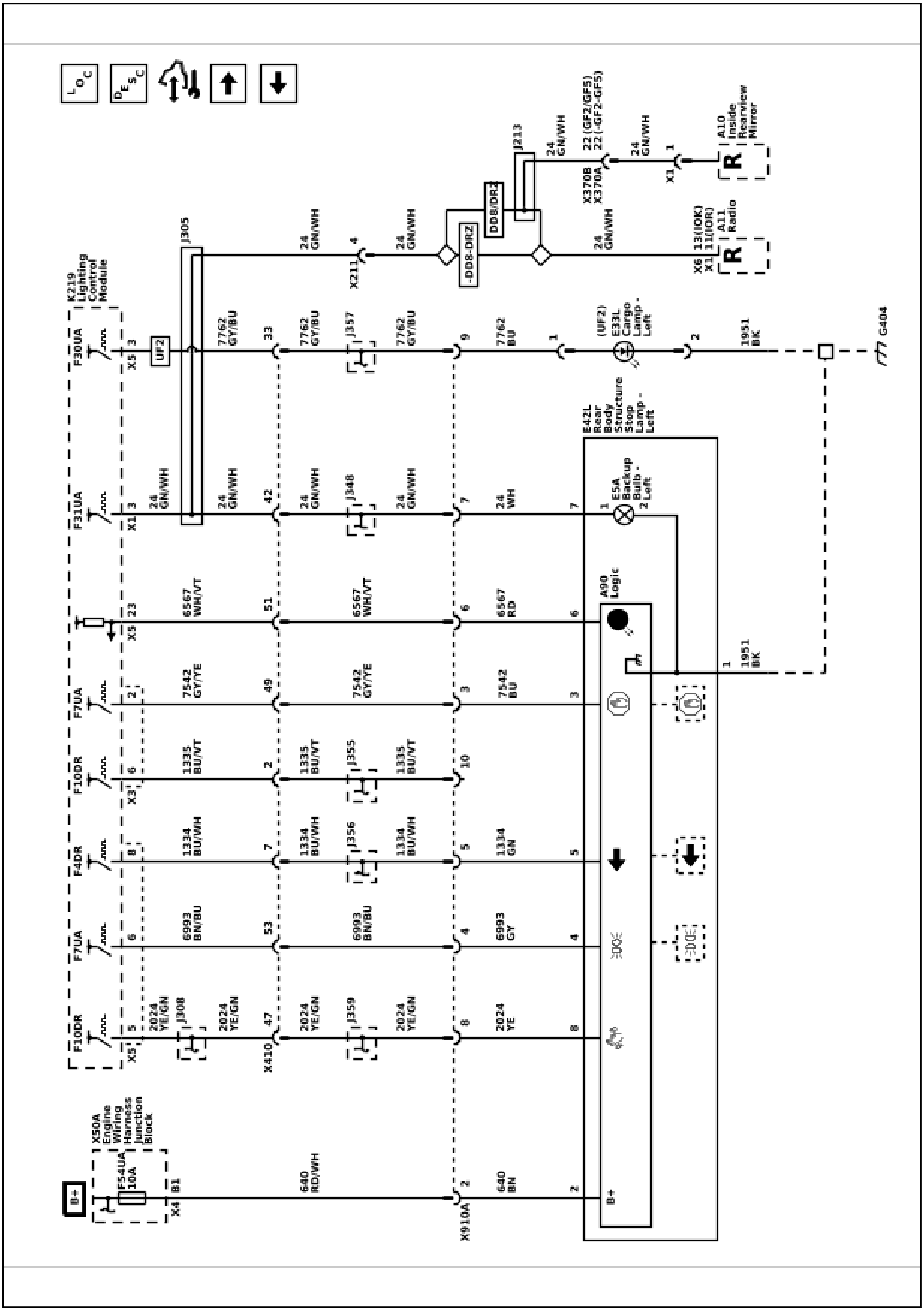

F30UA
F7UA
F31UA
F4DR
K219 Lighting Control Module
X5 3
6
X1 3
X5 8
UF2
7762 GY/BU
6993 BN/BU
24 GN/WH
1334 BU/WH
J305
X410 33
53
42
7
J348
J357
X211 4
7762 GY/BU
24 GN/WH
A
L
E33R Cargo Lamp - Right
E5B Backup Bulb - Right
-DD8-DRZ
DD8/DRZ
J213
X910A 9
4
7
5
7762 BU
6993 BN
24 GN
1334 GN
X370B 22 (GF2/GF5)
X370A 22 (-GF2-GF5)
1
(UF2)
E33L Cargo Lamp - Left
2
MIN
MAJ
E55BU Stop and Turn Signal and Tail Lamp Bulb - Left Upper
GND
E5A Backup Bulb - Left
E55BL Stop and Turn Signal and Tail Lamp Bulb - Left Lower
E2LRB Side Marker Bulb - Left Rear
E42L Rear Body Structure Stop Lamp - Left
X6 13(IOK)
X1 13(IOR)
A11 Radio
X1 1
A10 Inside Rearview Mirror
1951 BK
G404
6846176

Exterior Lights Schematics (Tail Lamp Assembly - Right ((GF2 / GF3 / GF5) & SRW))

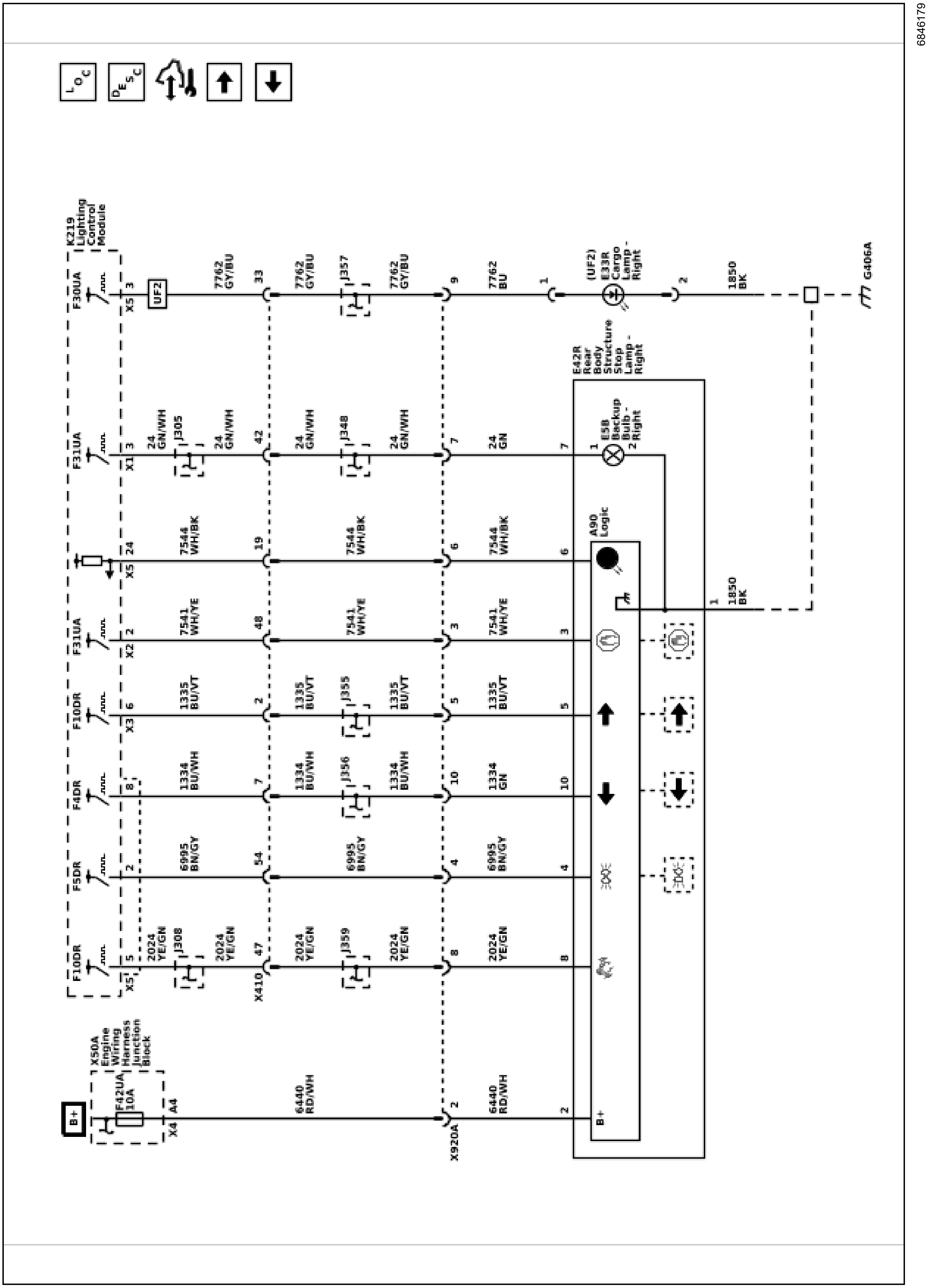

F5DR
F10DR
K219 Lighting Control Module
X5 2
X3 6
6995 BN/GY
1335 BU/VT
X410 54
2
K219 Lighting Control Module
A
UF2
7762 GY/BU
K219 Lighting Control Module
L
24 GN/WH
6995 BN/GY
1335 BU/VT
X920A 9
1
4
5
7762 BU
6995 BN
24 GN
1335 GN
1
6995 BN
1335 GN
6995 BN
6995 BN
1335 GN
6995 BN
(UF2) E33R Cargo Lamp - Right
MIN
MAJ
E5TBU Stop and Turn Signal and Tail Lamp Bulb - Right Upper
GND
1
E5B Backup Bulb - Right
2
MIN
MAJ
E5TBL Stop and Turn Signal and Tail Lamp Bulb - Right Lower
GND
1
E2RRB Side Marker Bulb - Right Rear
2
E42R Rear Body Structure Stop Lamp - Right
2
1850 BK
1850 BK
1850 BK
1850 BK
1850 BK
G406A

6846177

Exterior Lights Schematics (Tail Lamp Assembly - Left (DZW / ((GF9 / GFD / GRZ) & SRW)))

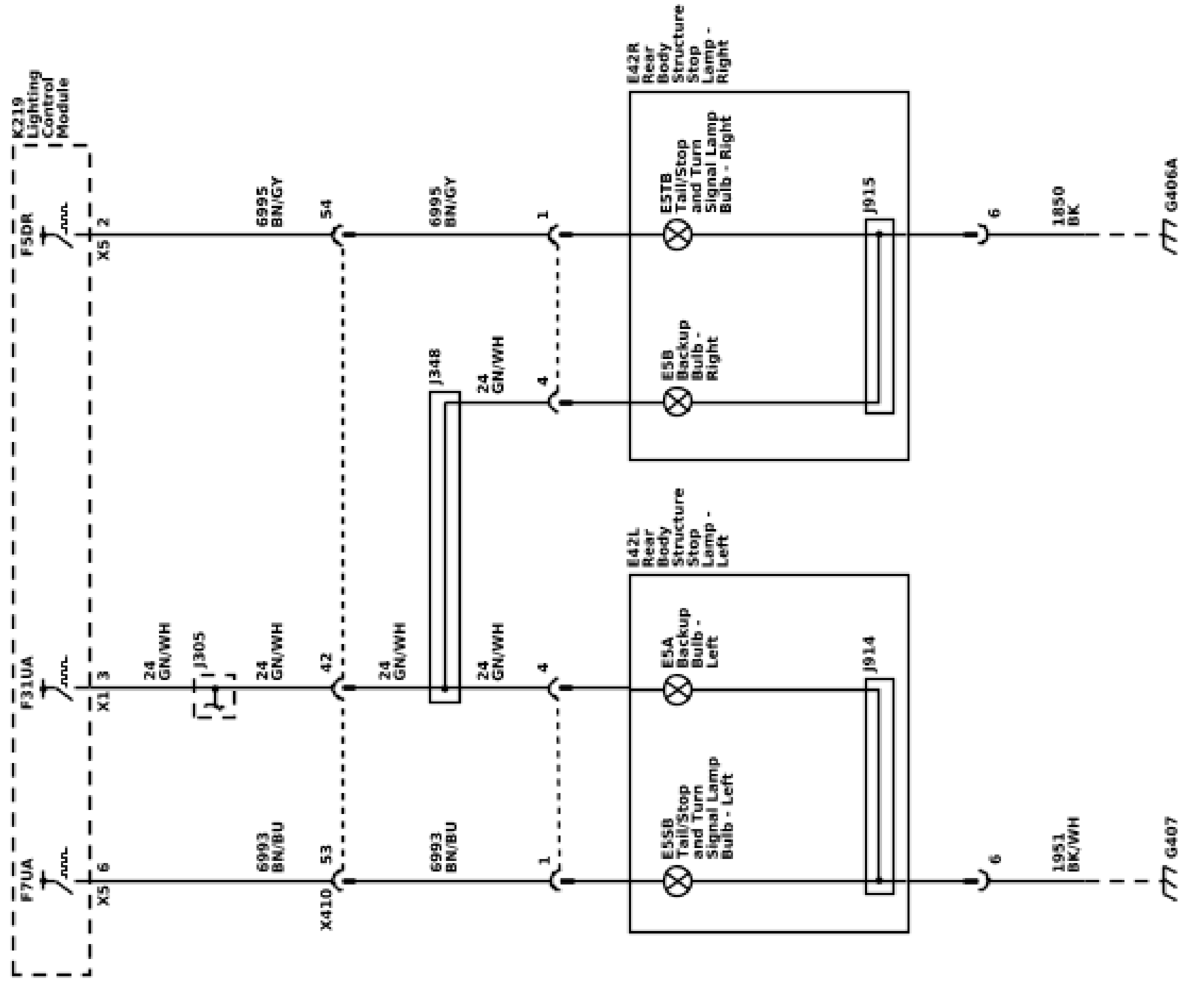

6846178
K219 Lighting Control Module
F30UA X5 3
UF2
7762 GY/BU
33
J357
9
7762 BU
1
(UF2) E33L Cargo Lamp - Left
2
1951 BK
G404
J305
24 GN/WH
X211 4
-DD8-DRZ
DD8/DRZ
J213
X370B 22 (GF2/GF5)
X370A 22 (-GF2-GF5)
X1 1
A10 Inside Rearview Mirror
X6 13(IOK)
X1 11(IOR)
A11 Radio
F31UA X1 3
42
J348
7
24 WH
E42L Rear Body Structure Stop Lamp - Left
E5A Backup Bulb - 2 Left
X5 23
6567 WH/VT
51
6
6567 RD
A90 Logic
1951 BK
F7UA 2
7542 GY/YE
49
3
7542 BU
F10DR X3 6
1335 BU/VT
2
J355
10
F4DR 8
1334 BU/WH
7
J356
5
1334 GN
F7UA 6
6993 BN/BU
53
4
6993 GY
F10DR X5 5
2024 YE/GN
J308
X410 47
J359
8
2024 YE
B+
X50A Engine Wiring Harness Junction Block
F54UA 10A
X4 B1
640 RD/WH
X910A 2
640 BN
2
B+

Exterior Lights Schematics (Tail Lamp Assembly - Right (DZW / ((GF9 / GFD / GRZ) & SRW)))

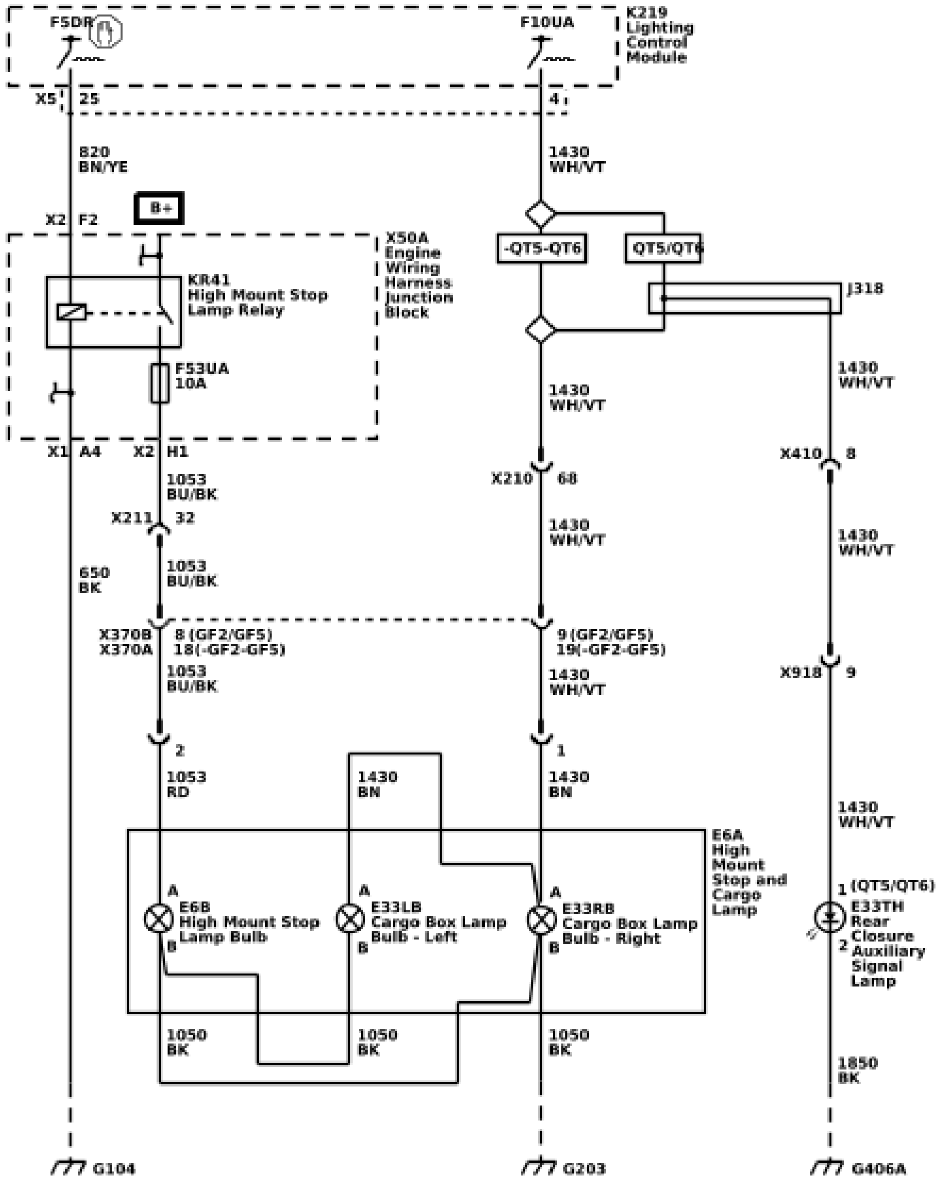

6846179
B+
X50A Engine Wiring Harness Junction Block
F42UA 10A
X4 A4
6440 RD/WH
X920A 2
6440 RD/WH
2
B+
K219 Lighting Control Module
F10DR
X5 5
2024 YE/GN
J308
2024 YE/GN
X410 47
2024 YE/GN
J359
2024 YE/GN
8
2024 YE/GN
8
F5DR
2
6995 BN/GY
54
6995 BN/GY
4
6995 BN/GY
4
F4DR
8
1334 BU/WH
7
1334 BU/WH
J356
1334 BU/WH
10
1334 GN
10
F10DR
X3 6
1335 BU/VT
2
1335 BU/VT
J355
1335 BU/VT
5
1335 BU/VT
5
F31UA
X2 2
7541 WH/YE
48
7541 WH/YE
3
7541 WH/YE
3
X5 24
7544 WH/BK
19
7544 WH/BK
6
7544 WH/BK
6
A90 Logic
1
1850 BK
F31UA
X1 3
24 GN/WH
J305
24 GN/WH
42
24 GN/WH
J348
24 GN/WH
7
24 GN
7
1
E58 Backup Bulb - Right
2
E42R Rear Body Structure Stop Lamp - Right
F30UA
X5 3
UF2
7762 GY/BU
33
7762 GY/BU
J357
7762 GY/BU
9
7762 BU
1
(UF2) E33R Cargo Lamp - Right
2
1850 BK
G406A

6846180

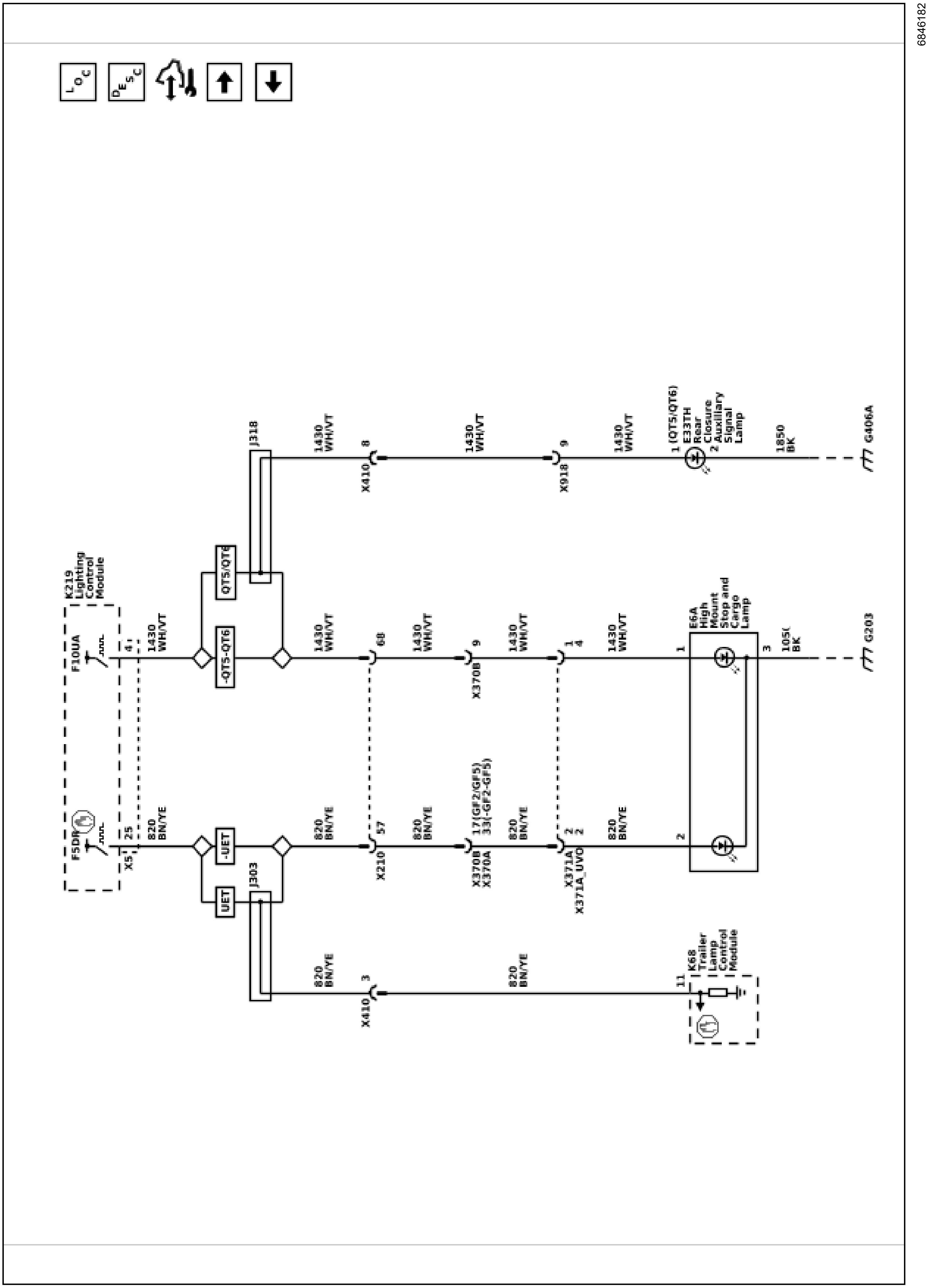
Exterior Lights Schematics (Tail Lamp Assemblies (ZW9))


K219 Lighting Control Module
F5DR
X5 2
F31UA
X1 3
F7UA
X5 6
6995 BN/GY
54
6995 BN/GY
1
24 GN/WH
J305
24 GN/WH
42
24 GN/WH
J348
24 GN/WH
4
24 GN/WH
4
6993 BN/BU
53
X410
6993 BN/BU
1
E42R Rear Body Structure Stop Lamp - Right
E5TB Tail/Stop and Turn Signal Lamp Bulb - Right
E5B Backup Bulb - Right
J915
6
1850 BK
G406A
E42L Rear Body Structure Stop Lamp - Left
E5A Backup Bulb - Left
E5SB Tail/Stop and Turn Signal Lamp Bulb - Left
J914
6
1951 BK/WH
G407

Exterior Lights Schematics (Center High Mount Stop and Exterior Courtesy Lights - Regular Cab)

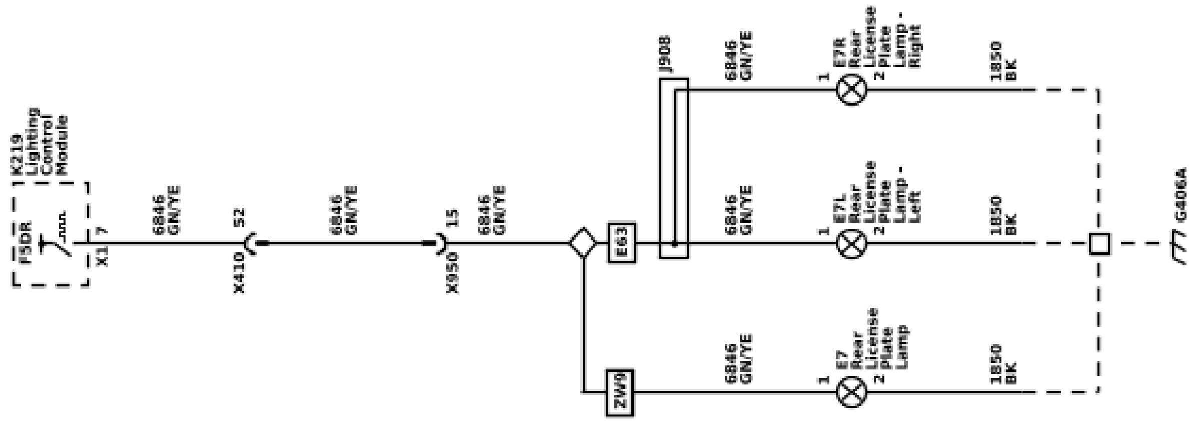

F5DR
F10UA
K219 Lighting Control Module
X5 25
4
820 BN/YE
1430 WH/VT
B+
X2 F2
X50A Engine Wiring Harness Junction Block
KR41 High Mount Stop Lamp Relay
F53UA 10A
-QT5-QT6
QT5/QT6
J318
1430 WH/VT
1430 WH/VT
X1 A4
X2 H1
1053 BU/BK
X410 8
X210 68
X211 32
650 BK
1053 BU/BK
1430 WH/VT
1430 WH/VT
X370B X370A
8 (GF2/GF5) 18(-GF2-GF5)
9 (GF2/GF5) 19(-GF2-GF5)
X918 9
1053 BU/BK
1430 WH/VT
2
1
1053 RD
1430 BN
1430 BN
1430 WH/VT
E6A High Mount Stop and Cargo Lamp
A
E6B High Mount Stop Lamp Bulb
B
A
E33LB Cargo Box Lamp Bulb - Left
B
A
E33RB Cargo Box Lamp Bulb - Right
B
1 (QT5/QT6)
E33TH Rear Closure Auxiliary Signal Lamp
2
1050 BK
1050 BK
1050 BK
1850 BK
G104
G203
G406A
6846181

Exterior Lights Schematics (Center High Mount Stop and Exterior Courtesy Lights - Double Cab/Crew Cab)

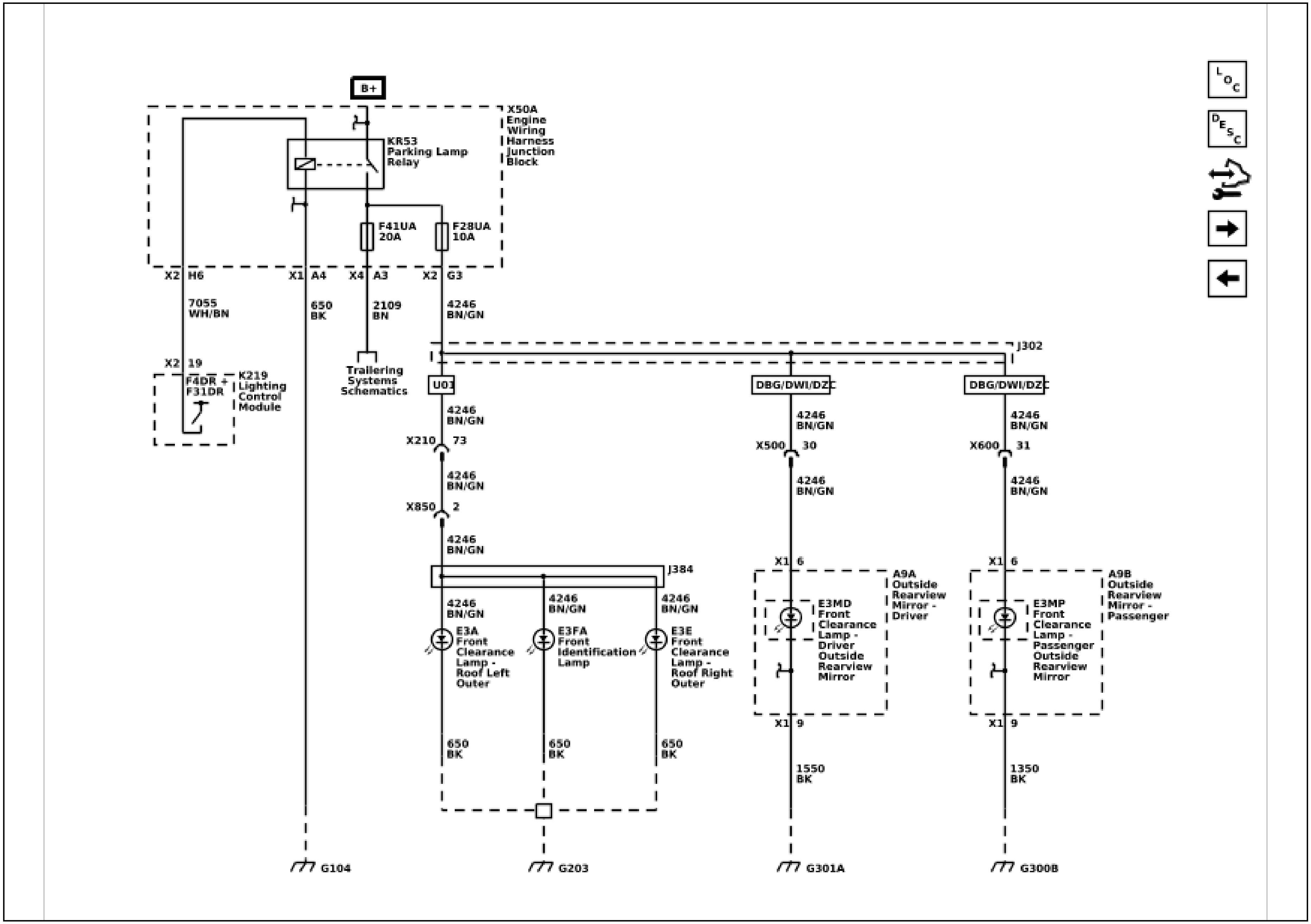

6846182
K219 Lighting Control Module
F10UA
F5DR
X5
4
25
1430 WH/VT
820 BN/YE
QT5/QT6
-QT5-QT6
UET
-UET
J318
J303
X410
8
3
68
57
X210
X370B
X370A
9
17(GF2/GF5)
33(-GF2-GF5)
X918
X371A
X371A_UVO
1
4
2
1 (QT5/QT6)
E33TH Rear Closure
2 Auxiliary Signal Lamp
E6A High Mount Stop and Cargo Lamp
3
1850 BK
1050 BK
G406A
G203
K68 Trailer Lamp Control Module
11

Exterior Lights Schematics (License Plate Lamps)

6846183

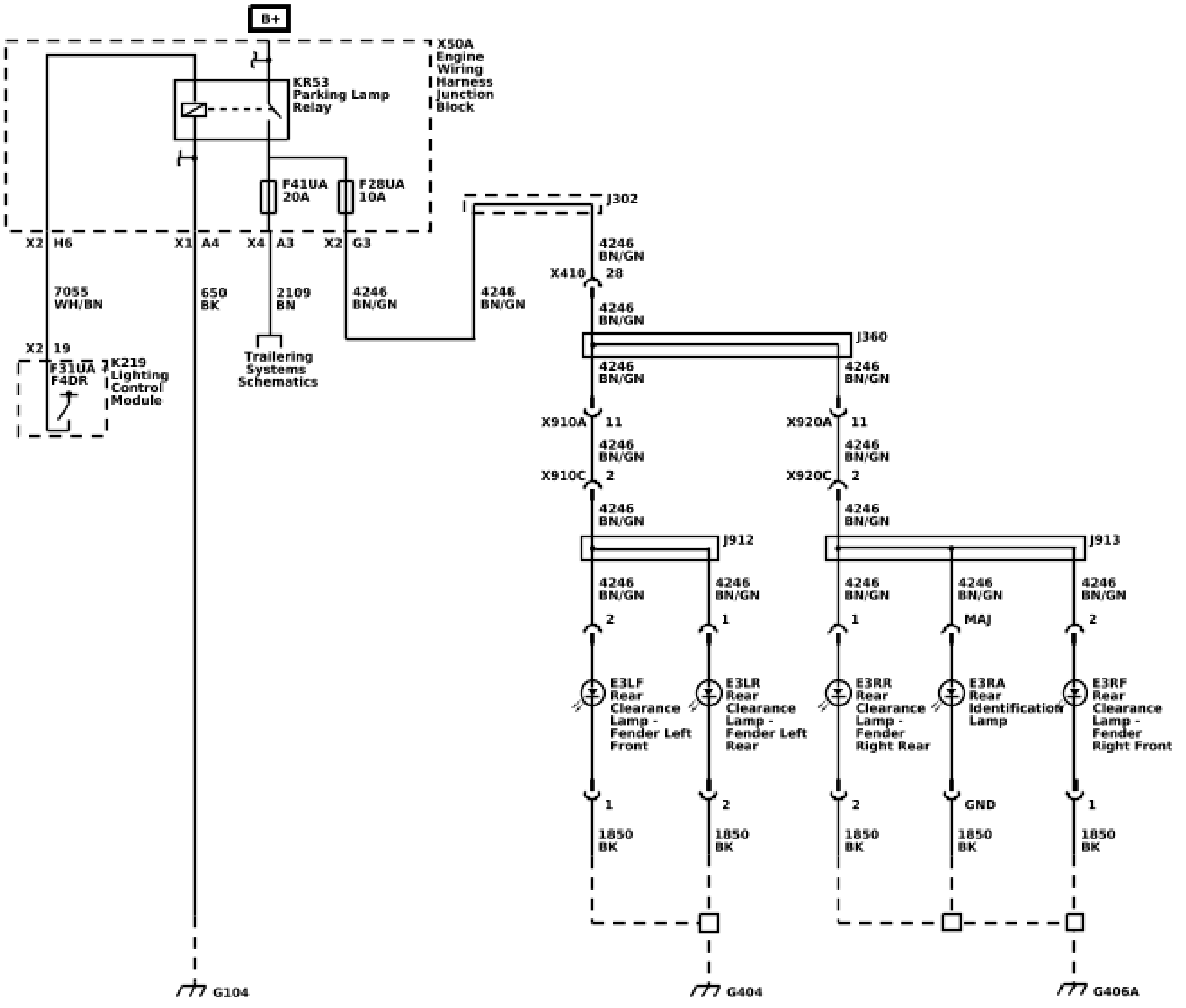

K219 Lighting Control Module
F5DR
X1 7
6846 GN/YE
52
X410
6846 GN/YE
15
X950
6846 GN/YE
E63
J908
ZW9
6846 GN/YE
6846 GN/YE
6846 GN/YE
1
E7R Rear License Plate Lamp - Right
2
1
E7L Rear License Plate Lamp - Left
2
1
E7 Rear License Plate Lamp
2
1850 BK
1850 BK
1850 BK
G406A

Exterior Lights Schematics (Identification Lights - Front (DBG / DWI / DZC / U01))


B+
X50A Engine Wiring Harness Junction Block
KR53 Parking Lamp Relay
F41UA 20A
F28UA 10A
X2 H6
X1 A4
X4 A3
X2 G3
7055 WH/BN
650 BK
2109 BN
4246 BN/GN
X2 19
F4DR + F31DR
K219 Lighting Control Module
Trailering Systems Schematics
J302
U01
DBG/DWI/DZC
DBG/DWI/DZC
4246 BN/GN
X210 73
X500 30
X600 31
4246 BN/GN
X850 2
4246 BN/GN
J384
4246 BN/GN
E3A Front Clearance Lamp - Roof Left Outer
E3FA Front Identification Lamp
E3E Front Clearance Lamp - Roof Right Outer
X1 6
A9A Outside Rearview Mirror - Driver
E3MD Front Clearance Lamp - Driver Outside Rearview Mirror
X1 9
A9B Outside Rearview Mirror - Passenger
E3MP Front Clearance Lamp - Passenger Outside Rearview Mirror
650 BK
1550 BK
1350 BK
G104
G203
G301A
G300B

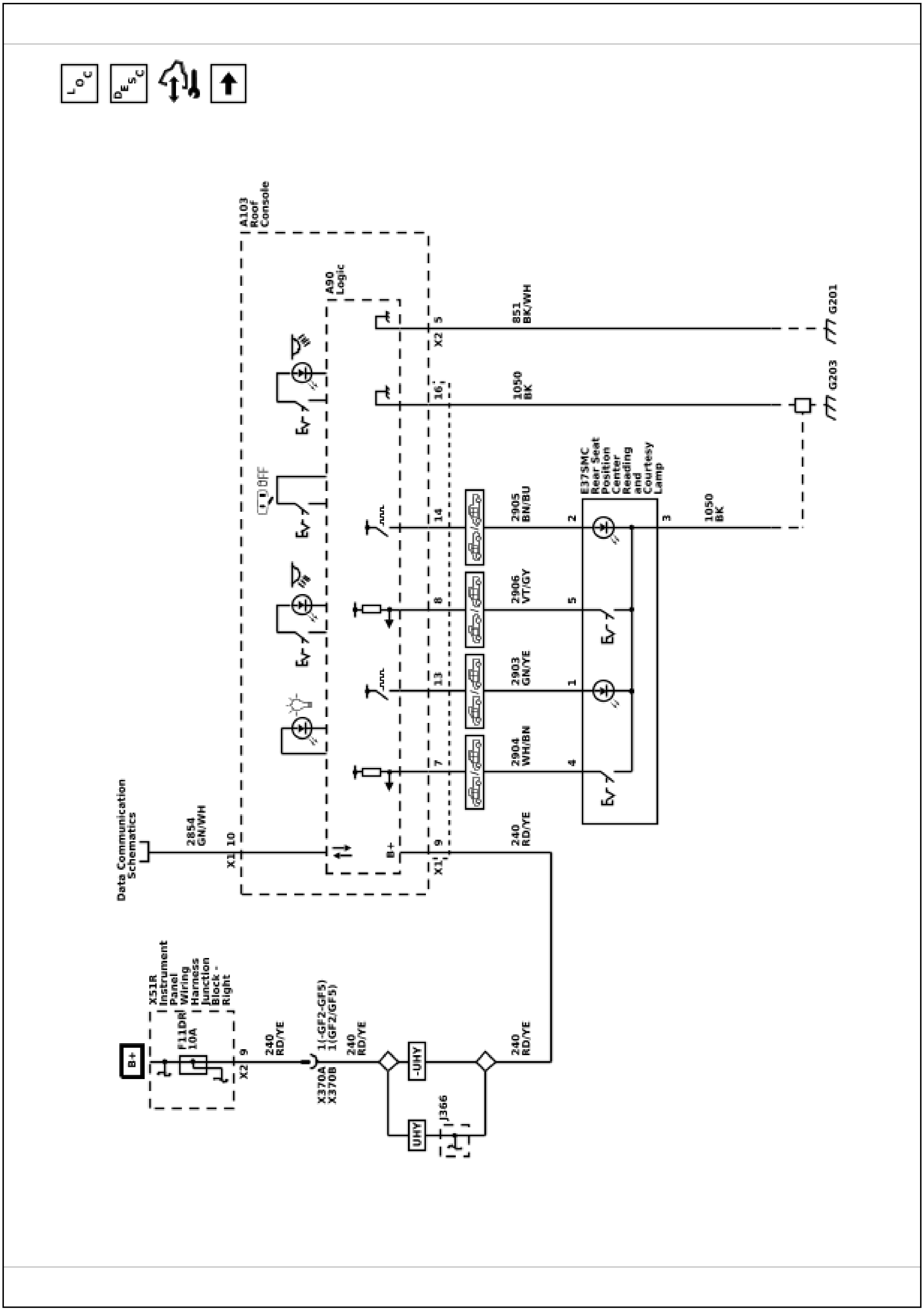
6846184

Exterior Lights Schematics (Identification Lights - Rear (DBG / DWI / DZC / U01))

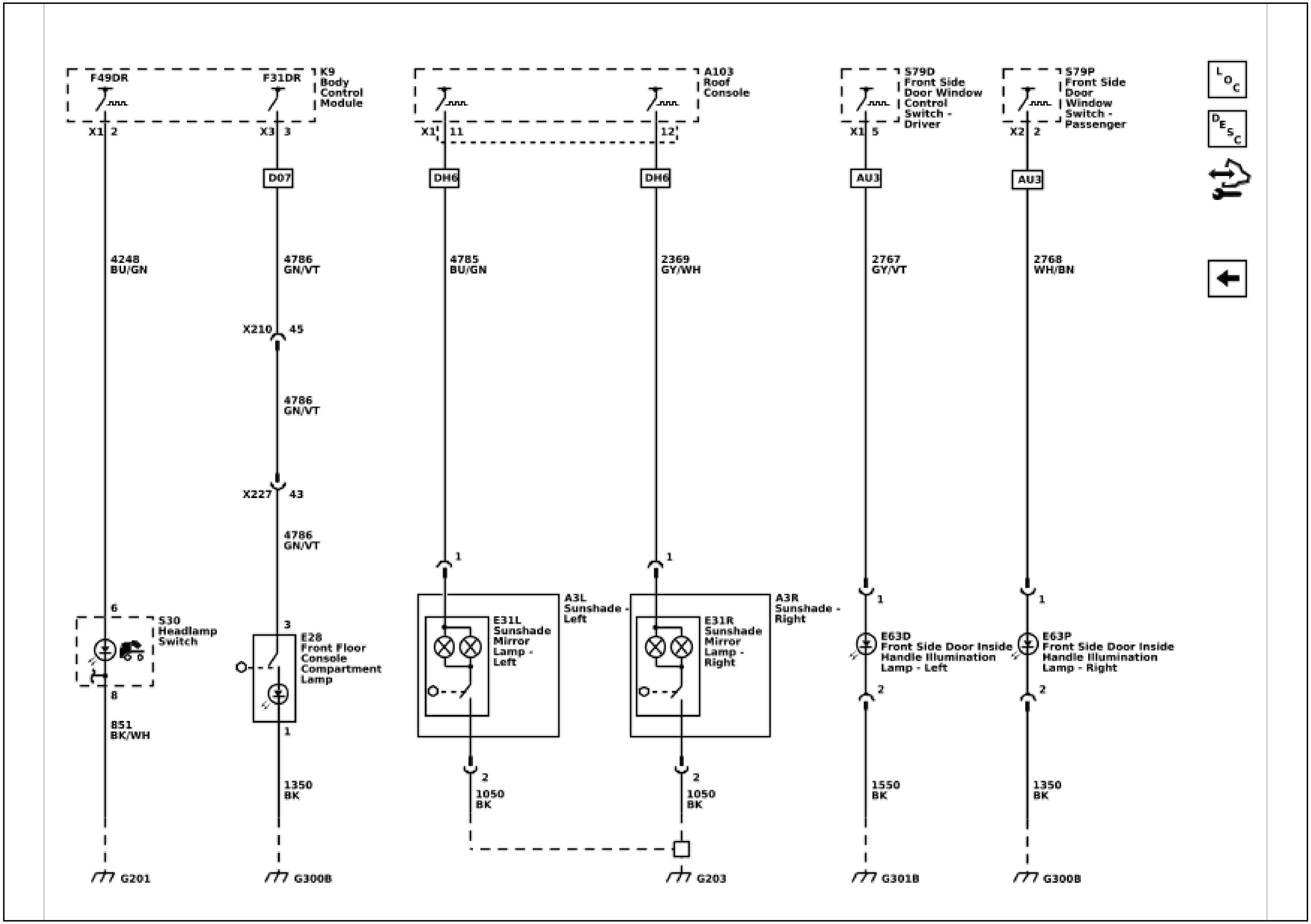

B+
X50A Engine Wiring Harness Junction Block
KR53 Parking Lamp Relay
F41UA 20A
F28UA 10A
X2 H6
X1 A4
X4 A3
X2 G3
7055 WH/BN
650 BK
2109 BN
4246 BN/GN
X2 19
F31UA F4DR
K219 Lighting Control Module
Trailering Systems Schematics
J302
X410 28
J360
X910A 11
X910C 2
X920A 11
X920C 2
J912
J913
2
1
MAJ
E3LF Rear Clearance Lamp - Fender Left Front
E3LR Rear Clearance Lamp - Fender Left Rear
E3RR Rear Clearance Lamp - Fender Right Rear
E3RA Rear Identification Lamp
E3RF Rear Clearance Lamp - Fender Right Front
GND
1850 BK
G104
G404
G406A

6846185

Interior Lights Schematics (Roof Console and Rear Seat Reading and Courtesy Lamps - Double Cab/Crew Cab)

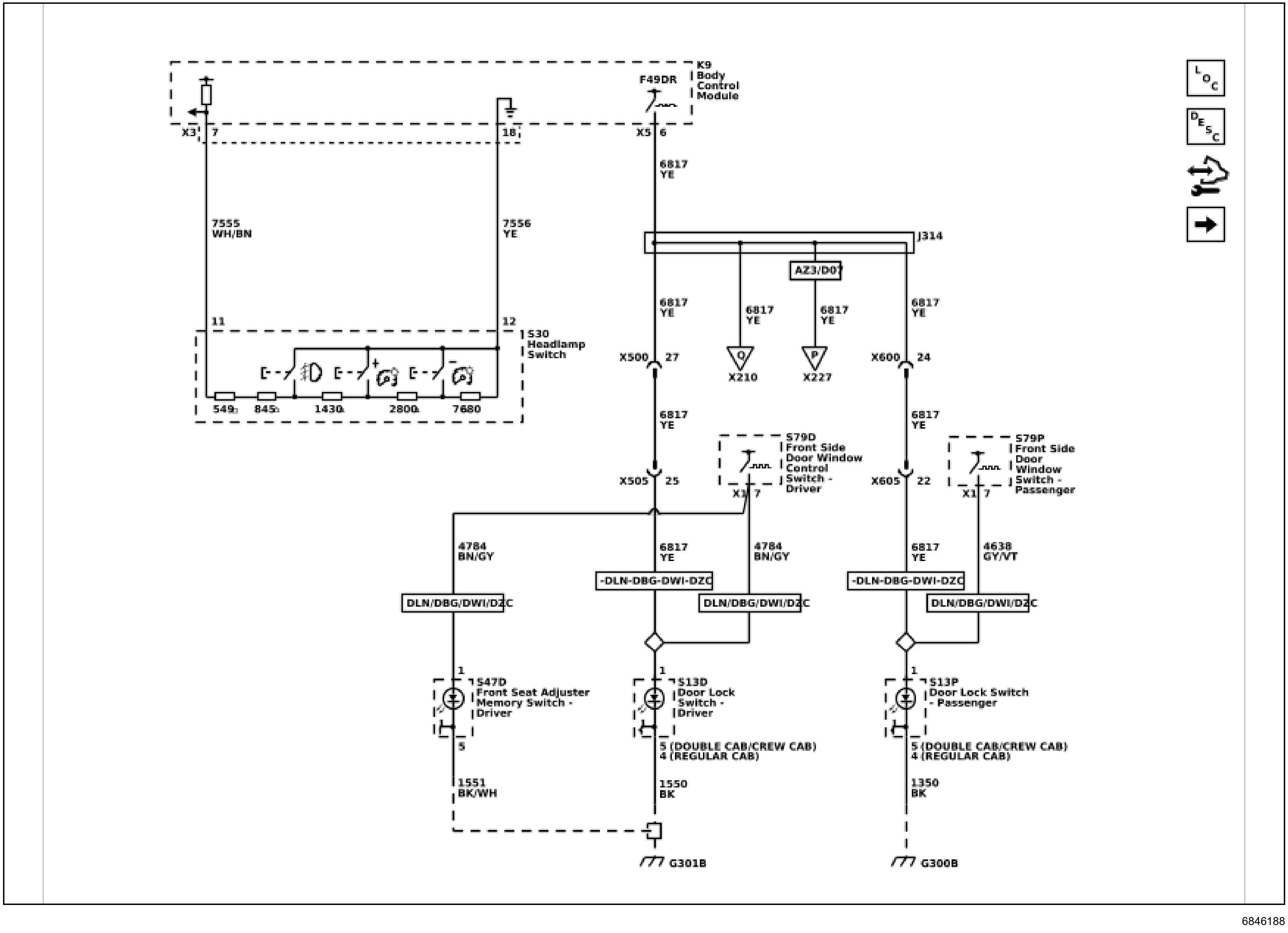

6846186
LOC
DESC
B+
F11DR 10A
X51R Instrument Panel Wiring Harness Junction Block - Right
X2 9
240 RD/YE
X370A 1(-GF2-GF5)
X370B 1(GF2/GF5)
240 RD/YE
-UHY
UHY
J366
240 RD/YE
Data Communication Schematics
2854 GN/WH
X1 10
A103 Roof Console
A90 Logic
B+
X1 9
240 RD/YE
OFF
7
8
13
14
16
X2 5
2904 WH/BN
2903 GN/YE
2906 VT/GY
2905 BN/BU
1050 BK
851 BK/WH
4
1
5
2
3
E37SMC Rear Seat Position Center Reading and Courtesy Lamp
1050 BK
G203
G201

Interior Lights Schematics (Cargo Lamp Indicator, Sunshade, Center Console, and Door Lamps)

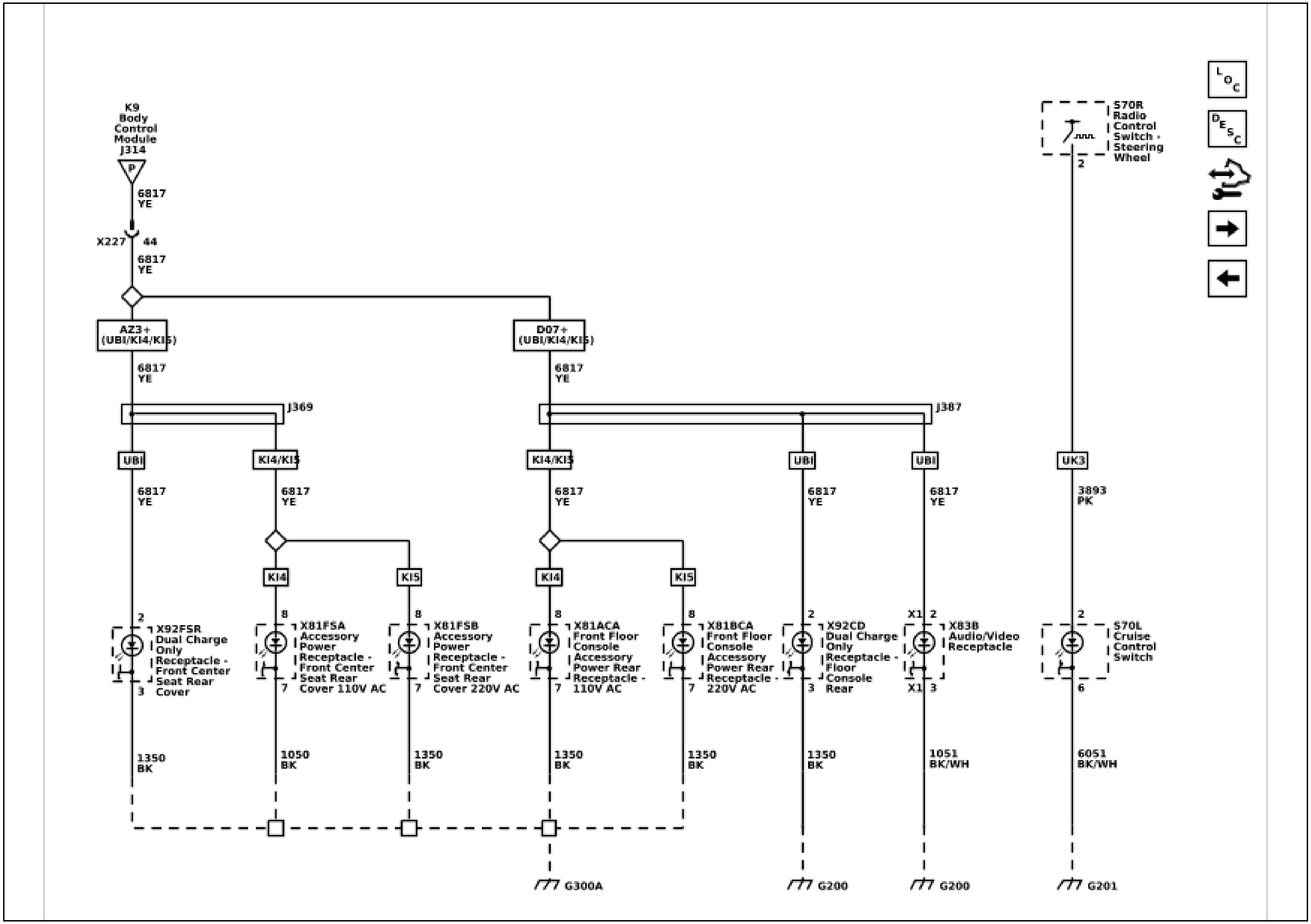

F49DR
F31DR
K9 Body Control Module
X1 2
X3 3
A103 Roof Console
X1 11
12
S79D Front Side Door Window Control Switch - Driver
X1 5
S79P Front Side Door Window Switch - Passenger
X2 2
D07
DH6
DH6
AU3
AU3
4248 BU/GN
4786 GN/VT
4785 BU/GN
2369 GY/WH
2767 GY/VT
2768 WH/BN
X210 45
4786 GN/VT
X227 43
4786 GN/VT
1
1
1
1
6
S30 Headlamp Switch
8
851 BK/WH
3
E28 Front Floor Console Compartment Lamp
1
1350 BK
A3L Sunshade - Left
E31L Sunshade Mirror Lamp - Left
2
1050 BK
A3R Sunshade - Right
E31R Sunshade Mirror Lamp - Right
2
1050 BK
E63D Front Side Door Inside Handle Illumination Lamp - Left
2
1550 BK
E63P Front Side Door Inside Handle Illumination Lamp - Right
2
1350 BK
G201
G300B
G203
G301B
G300B
L O C
D E S C

6846187

Interior Lights Dimming Schematics (Controls and Front Door Backlights)

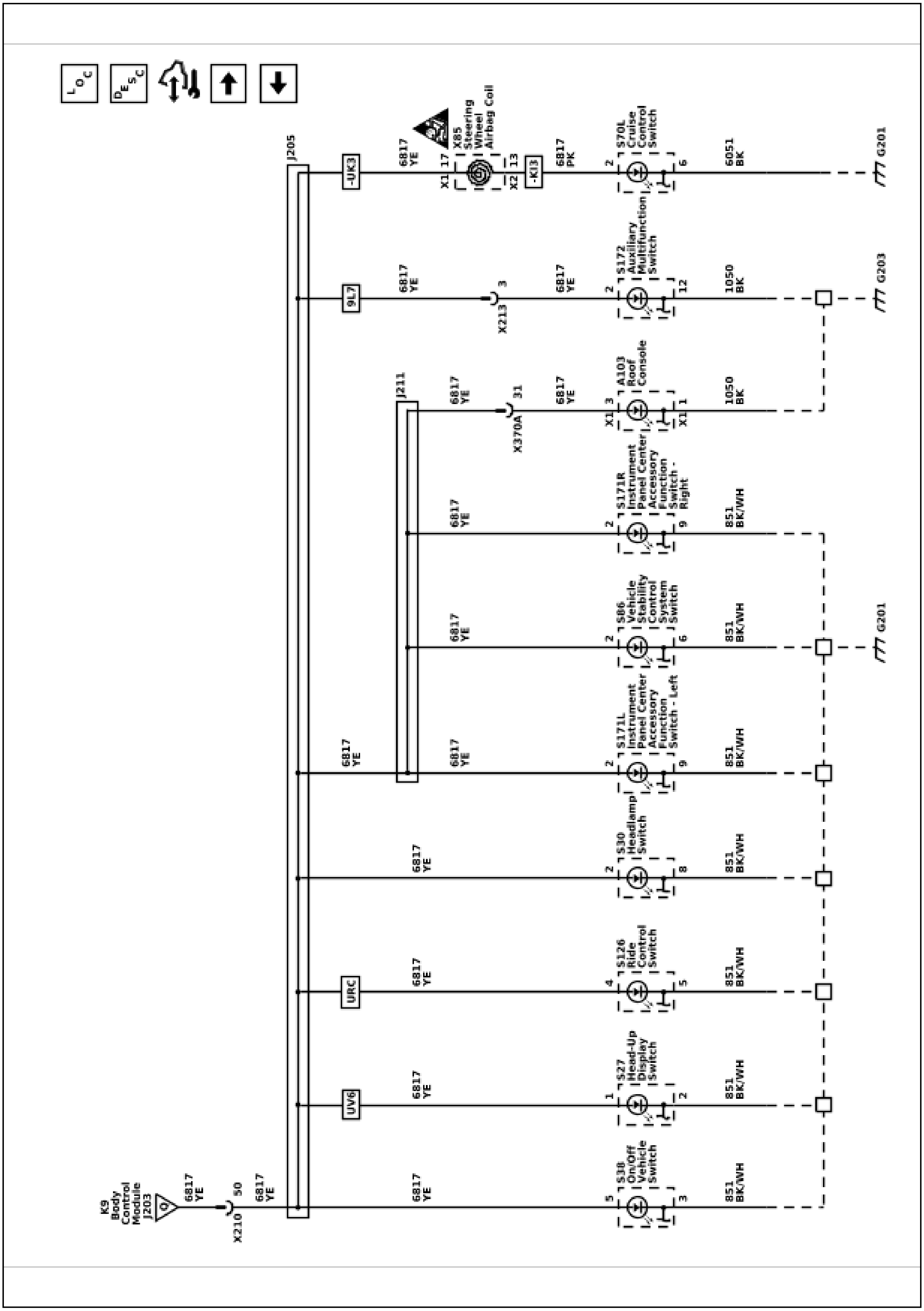

K9
Body
Control
Module
F49DR
X3 7
18
X5 6
6817
YE
7555
WH/BN
7556
YE
J314
AZ3/D07
11
12
S30
Headlamp
Switch
549Ω
845Ω
1430Ω
2800Ω
7680
X500 27
X210
X227
X600 24
S79D
Front Side
Door Window
Control
Switch -
Driver
X1 7
X505 25
S79P
Front Side
Door
Window
Switch -
Passenger
X605 22
4784
BN/GY
4638
GY/VT
-DLN-DBG-DWI-DZC
DLN/DBG/DWI/DZC
1
S47D
Front Seat Adjuster
Memory Switch -
Driver
5
1551
BK/WH
S13D
Door Lock
Switch -
Driver
5 (DOUBLE CAB/CREW CAB)
4 (REGULAR CAB)
1550
BK
G301B
S13P
Door Lock Switch
- Passenger
1350
BK
G300B
6846188

Interior Lights Dimming Schematics (Steering Wheel, Floor Console, and Center Seat Backlights)


K9
Body
Control
Module
J314
P
6817
YE
X227
44
6817
YE
AZ3+
(UBI/KI4/KI5)
D07+
(UBI/KI4/KI5)
6817
YE
J369
J387
UBI
KI4/KI5
KI4/KI5
UBI
UBI
UK3
6817
YE
3893
PK
KI4
KI5
KI4
KI5
S70R
Radio
Control
Switch -
Steering
Wheel
2
X92FSR
Dual Charge
Only
Receptacle -
Front Center
Seat Rear
Cover
X81FSA
Accessory
Power
Receptacle -
Front Center
Seat Rear
Cover 110V AC
X81FSB
Accessory
Power
Receptacle -
Front Center
Seat Rear
Cover 220V AC
X81ACA
Front Floor
Console
Accessory
Power Rear
Receptacle -
110V AC
X81BCA
Front Floor
Console
Accessory
Power Rear
Receptacle -
220V AC
X92CD
Dual Charge
Only
Receptacle -
Floor
Console
Rear
X83B
Audio/Video
Receptacle
S70L
Cruise
Control
Switch
2
3
8
7
X1 2
X1 3
6
1350
BK
1050
BK
1051
BK/WH
6051
BK/WH
G300A
G200
G200
G201

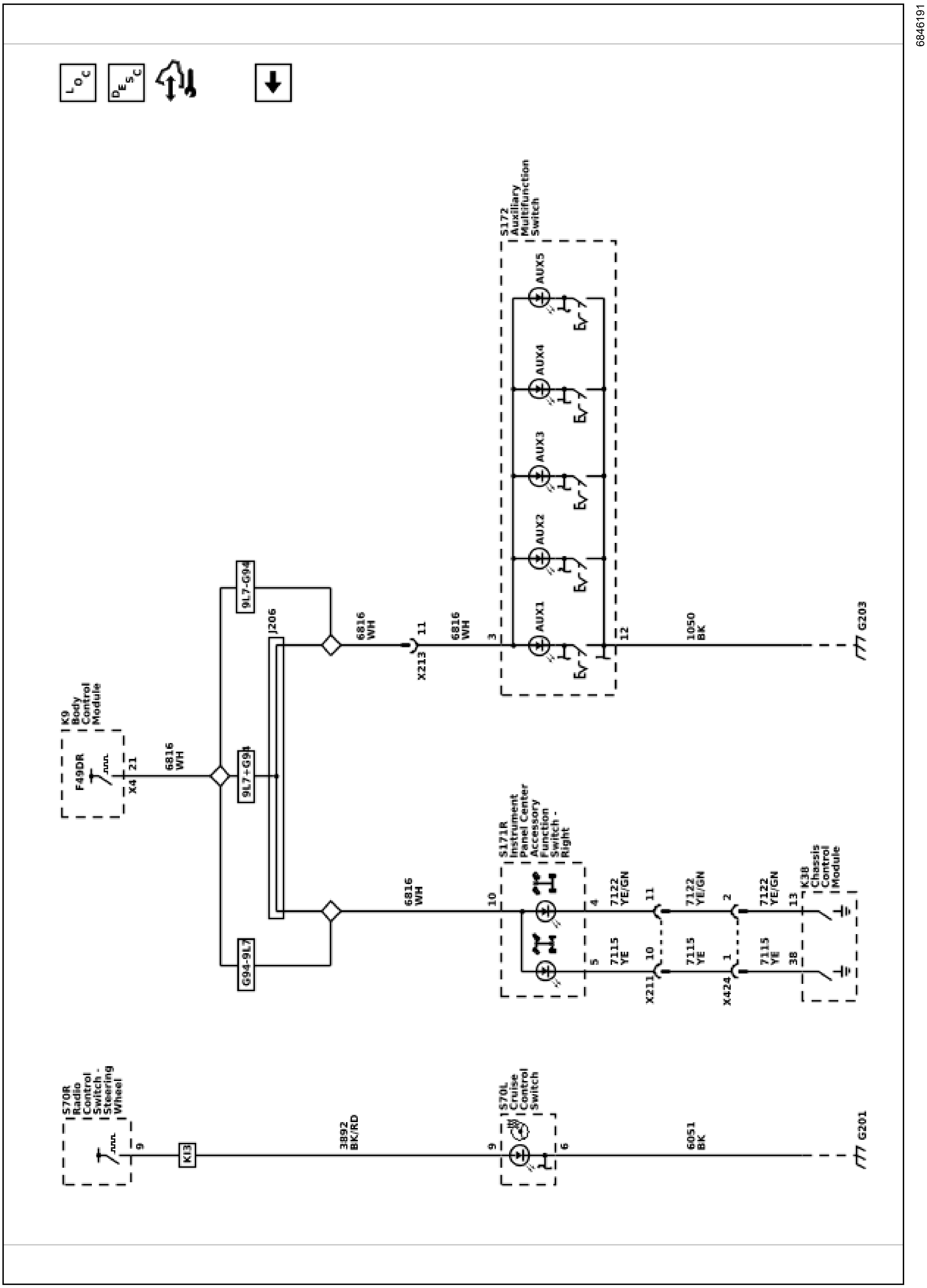
6846189

Interior Lights Dimming Schematics (Instrument Panel Backlights)


K9
Body
Control
Module
J203
Q
6817
YE
X210
50
6817
YE
J205
J211
-UK3
9L7
URC
UV6
6817
YE
X85
Steering
Wheel
Airbag Coil
X1 17
X2 13
-KI3
6817
PK
X213
3
X370A
31
S70L
Cruise
Control
Switch
S172
Auxiliary
Multifunction
Switch
A103
Roof
Console
X1 3
X1 1
S171R
Instrument
Panel Center
Accessory
Function
Switch -
Right
S86
Vehicle
Stability
Control
System
Switch
S171L
Instrument
Panel Center
Accessory
Function
Switch - Left
S30
Headlamp
Switch
S126
Ride
Control
Switch
S27
Head-Up
Display
Switch
S38
On/Off
Vehicle
Switch
2
6
12
9
8
4
5
1
3
6051
BK
1050
BK
851
BK/WH
G201
G203
G201

6846190

Interior Lights Dimming Schematics (Indicators)


6846191
K9 Body Control Module
F49DR
X4 21
6816 WH
9L7-G94
9L7+G94
G94-9L7
J206
6816 WH
X213 11
6816 WH
3
S172 Auxiliary Multifunction Switch
AUX1
AUX2
AUX3
AUX4
AUX5
12
1050 BK
G203
S171R Instrument Panel Center Accessory Function Switch - Right
10
4
5
7122 YE/GN
7115 YE
X211 11
X211 10
7122 YE/GN
7115 YE
X424 2
X424 1
7122 YE/GN
7115 YE
13
38
K38 Chassis Control Module
S70R Radio Control Switch - Steering Wheel
9
KI3
3892 BK/RD
S70L Cruise Control Switch
9
6
6051 BK
G201

Description and Operation

Exterior Lighting Systems Description and Operation

The exterior lighting system consist of the following lamps:

- Backup lamps
- Cargo lamps
- Daytime running lamps (DRL)
- Exterior courtesy lamps
- Hazard warning lamps
- Headlamps
- Park, tail, license, and marker lamps
- {T3U} Front fog lamps
- {B3L / BRS} Running board lamps
- Stop lamps
- Task lamps
- Turn signal lamps
- Trailer lighting, refer to *Trailering Description and Operation 1-69* for more information.

Low Beam Headlamps

The headlamps may be turned ON in 3 different ways:

- When the headlamp switch is placed in the ON position, for normal operation
- When the headlamp switch is placed in the AUTO position, for automatic lamp control during low ambient light conditions
- When the headlamp switch is placed in the AUTO position, with the windshield wipers ON in daylight conditions, after a 6 second delay

The K9 Body Control Module (BCM) monitors three signal circuits from the S30 Headlamp Switch. When the headlamp switch is in the AUTO position, the three signal circuits are unaffected (open) and the BCM relies on the B10D Sun Load and Ambient Light and Security Indicator Sensor input to determine if headlamps are required or if daytime running lamps will be activated based on outside lighting conditions. When the headlamp switch is placed in the headlamp OFF position, the headlamp switch headlamps OFF signal circuit is grounded, indicating to the BCM that the exterior lamps should be turned OFF. With the headlamp switch in the PARK LAMPS position, the headlamp switch park lamps ON signal circuit is grounded, indicating that the park lamps have been requested. When the headlamp switch is in the HEADLAMP position, both the headlamp switch park lamps ON signal circuit and the headlamps ON signal circuit are grounded. The BCM responds to these inputs by sending a serial data message to the K219 Lighting Control Module. The Lighting Control Module responds by applying pulse width modulated (PWM) voltage to both headlamp low beam control circuits, illuminating the low beam headlamps. When the Lighting Control Module commands the low beam headlamps ON, the operator will notice the interior backlighting for the instrument cluster and the various other switches dim to the level of brightness selected by the instrument panel dimmer switch.

High Beam Headlamps

The high beam and flash to pass (FTP) functions are contained within the S78 Turn Signal Switch. The K9 Body Control Module (BCM) provides the turn signal/ multifunction switch with two signal circuits, the high beam signal circuit and the FTP signal circuit. When the low beam headlamps are ON, and the turn signal/ multifunction switch is placed in either the high beam position or FTP position, ground is applied to the BCM through the high beam/FTP signal circuit. The BCM responds to the high beam request by sending a serial data message to the K219 Lighting Control Module. The Lighting Control Module responds by applying pulse width modulated (PWM) voltage to both headlamp high beam control circuits, illuminating the high beam headlamps. The status of the high beam lamps is shown by a blue indicator located on the instrument cluster. When high beams are commanded on, the indicator will be illuminated continuously. If the driver turns the high beams off, the indicator will also turn off.

Flash to Pass

When the S78 Turn Signal Switch is momentarily placed in the flash to pass position, ground is applied to the turn signal/multifunction switch. The turn signal/ multifunction switch applies ground to the K9 Body Control Module (BCM) through the flash to pass switch signal circuit. The BCM responds to the flash to pass request by sending a serial data message to the K219 Lighting Control Module. The Lighting Control Module responds by applying pulse width modulated (PWM) voltage to both headlamp high beam control circuits, illuminating the high beam headlamps. This causes the high beam headlamps to illuminate at full brightness until the turn signal/multifunction switch is returned to the at rest position.

Automatic Headlamp Control

The K9 Body Control Module (BCM) monitors three signal circuits from the S30 Headlamp Switch. When the headlamp switch is in the AUTO position, the three signal circuits are unaffected (open) and the BCM relies on the B10D Sun Load and Ambient Light and Security Indicator Sensor input to determine if headlamps are required or if daytime running lamps will be activated based on outside lighting conditions. During automatic lamp control, the headlamps will be off during daylight conditions but will turn on when the ambient light sensor detects low ambient light conditions. The ambient light sensor is a light sensitive transistor that varies the voltage signal to the BCM. The BCM provides a 5 volt reference signal and a low reference ground to the ambient light sensor. During low light conditions the BCM will request the low beam headlamps ON by sending a serial data message to the K219 Lighting Control Module. The Lighting Control Module responds by applying pulse width modulated (PWM) voltage to both headlamp low beam control circuits, illuminating the low beam headlamps.

{TQ5} Intellibeam – Automatic High Beam Assist

The IntelliBeam system is activated by pressing the auto high beam assist button on the turn signal switch while the exterior lamp control is in AUTO or ON mode and the engine running. The IntelliBeam system consists of a front camera module that detects light, and is able to identify approaching vehicles on an even, straight road at a distance of greater than 0.4 km (0.25 mi). The front camera module analyzes light color, intensity, and movement. The IntelliBeam system will turn OFF the high beam headlamps when approaching vehicle headlamps or preceding vehicle taillights are detected by the front camera module. On vehicles equipped with Side Blind Zone Alert, IntelliBeam will proactively turn OFF the high beam headlamps when a vehicle is passing on the left or right side. The IntelliBeam system is turned off anytime the headlamp switch is moved out of the AUTO position.

IntelliBeam System Activation

- Vehicle ON
- Headlamp switch placed in the AUTO or ON position
- Outside lighting conditions must be dark
- Vehicle speed greater than 25 mph (40 km/h)

IntelliBeam System Operation

The following are conditions that the IntelliBeam system will turn the high beam headlamps off during operation:

- The system detects approaching traffic headlamps
- The system detects preceding traffic tail lamps
- The system detects a vehicle passing to the right or left (SBZA equipped only)
- Ambient light level too high due to towns or twilight situations
- The vehicle’s speed drops below 13 mph (22 km/h)
- Delay

Note: IntelliBeam may not operate properly if any of the following conditions exist:

- Approaching and preceding vehicles lamps are undetectable due to dirt, snow, road spray, smoke, fog, or any other airborne conditions.
- The front camera and/or side object sensor module(s) is covered with ice, dirt, snow, haze, or is obstructed.
- The vehicle is being driven on winding or hilly road conditions which would make any on coming vehicle headlamps undetectable by the IntelliBeam.

IntelliBeam System Deactivation

- Manually operating the headlamp switch from neutral to high beam position
- IntelliBeam is deactivated automatically when the front or rear fog lamps are turned ON

IntelliBeam System Indicator

The status of the IntelliBeam system is shown by a green indicator located on the instrument panel cluster. When IntelliBeam is active, the indicator will be illuminated continuously. If the operator deactivates the IntelliBeam system, the indicator will turn off.

Daytime Running Lamps

The daytime running lamps (DRL) will illuminate continuously when the following conditions are met:

- Engine running
- The headlamp switch is in the AUTO position
- Ambient light conditions are daytime conditions

The B10D Sun Load and Ambient Light and Security Indicator Sensor is used to monitor outside lighting conditions. The ambient light sensor provides a voltage signal that will vary between 0.2 and 4.9 volts depending on outside lighting conditions. The K9 Body Control Module (BCM) provides a 5 volt reference signal and a low reference ground to the ambient light sensor. The BCM monitors the ambient light sensor signal circuit to determine if outside lighting conditions are correct for either daytime running lamps (DRL) or automatic lamp control when the headlamp switch is in the AUTO position. In daylight conditions the BCM will send a serial data message to the K219 Lighting Control Module to command the DRLs ON, the Lighting Control Module responds by applying pulse width modulated (PWM) voltage to both DRL control circuits, illuminating the DRLs. During low light conditions the Lighting Control Module will command the low beam headlamps ON.

Hazard Lamps

The hazard flashers may be activated in any power mode. The Hazard Warning Switch signal circuit is momentarily grounded when the hazard switch is pressed. The K9 Body Control Module (BCM) responds to the hazard switch signal input by sending a serial data message to the K219 Lighting Control Module. The Lighting Control Module responds by supplying battery voltage to all turn signal lamps in an ON and OFF duty cycle. When the hazard switch is activated, the BCM also sends a serial data message to the instrument cluster requesting both turn signal indicators to be cycled ON and OFF.

Park, Tail, and License Lamps

When the S30 Headlamp Switch is placed in the HEAD or PARK position, ground is applied to the park lamp switch ON signal circuit to the K9 Body Control Module (BCM). The BCM responds to the park lamp switch signal input by sending a serial data message to the K219 Lighting Control Module. The Lighting Control Module responds by applying battery voltage to the park lamps, tail lamps, and license lamps control circuits illuminating the park, tail, and license lamps.

{T3U} Front Fog Lamps

The S30 Headlamp Switch is used to control the fog lights when equipped. The K9 Body Control Module (BCM) provides a 5V signal circuit and low reference circuit to the headlamp switch for backlight dimming and fog light controls. When a dimming/fog light button is pressed, the signal circuit becomes grounded through the appropriate resistor internal to the headlight switch and voltage from the BCM will decrease accordingly. The BCM interprets the signal and responds by sending a serial data message to the K219 Lighting Control Module. The lighting control module responds by applying pulse width modulated (PWM) voltage to the appropriate fog light(s).

{B3L / BRS} Running Board Lamps

When equipped (B3L / BRS), the running board assist step lamps become illuminated anytime unlock is pressed on the keyless entry transmitter during low ambient light conditions as part of the approach lighting system. The K9 Body Control Module responds to the unlock request during low ambient light conditions by sending a serial data message to the K4 Running Board Control Module to command the running board assist step lamps on. The running board control module responds by applying voltage to the running board assist step lamp control circuits illuminating the running board assist step lamp LEDs.

Stop Lamps

The B22 Brake Pedal Position Sensor is used to sense the action of the driver application of the brake pedal. The K9 Body Control Module (BCM) provides the brake pedal position sensor with low reference, signal, and 5 volt reference circuits. When the variable signal reaches a voltage threshold indicating the brakes have been applied, the BCM will respond by sending a serial data message to the K219 Lighting Control Module requesting the stop lamps to be turned ON. The Lighting Control Module responds by applying battery voltage to the left and right stop lamp control circuits as well as the center high mounted stop lamp control circuit illuminating the left and right stop lamps and the center high mounted stop lamp. If serial data communication is lost between the BCM and the Lighting Control Module, the Lighting Control Module will receive a serial data message from the Electronic Brake Control Module indicating that the brakes have been applied. If serial data communication is lost between all three modules, the Lighting Control Module also receives a hard wired voltage signal from the BCM to signal the brake lamps ON.

Turn Signal Lamps

Turn Signals

The K9 Body Control Module (BCM) provides the S78 Turn Signal Switch with left and right turn signal switch signal circuits. Ground is applied at all times to the turn signal/multifunction switch. The turn signal lamps may only be activated with the ignition switch in the ON or START positions. When the turn signal/multifunction switch is placed in either the turn right or turn left position, ground is applied to the BCM through either the right turn or left turn signal switch signal circuit. The BCM responds to the turn signal switch input by sending a serial data message to the K219 Lighting Control Module. The Lighting Control Module responds by applying a pulsating voltage to the turn signal lamps through there respective control circuits. When a turn signal request is received by the BCM, a serial data message is also sent to the instrument cluster requesting the respective turn signal indicator be pulsed ON and OFF.

Turn Signal Outage Detection

Vehicles with LED turn signals require additional turn signal outage detection circuits that provide turn signal feedback to the K219 Lighting Control Module. The Lighting Control Module uses the feedback information to send a serial data message to the instrument cluster to alert the driver anytime a turn signal fault is detected. If a fault is detected on a turn signal circuit or a turn signal feedback circuit, the turn signals will flash in a rapid manner to alert the driver of the fault.

Turn Signal Animation

When the K219 Lighting Control Module receives a serial data message from the K9 Body Control Module (BCM) that the turn signals are being commanded on, the lighting control module responds by applying a pulsating voltage to the front, mirror, and rear turn signal lamps through their respective control circuits. The left and right turn signal control circuits are connected to each front and rear lamp assemblies, this is for animation purposes. When a lamp assembly only receives one turn signal input, an animation effect takes place as a “swiping” motion for the turn signals. When a lamp assembly receives both turn signal inputs as part of the hazard lamps becoming active, the turn signals do not exhibit the animation effect and will flash without the “swiping” motion.

Backup Lamps

With the engine running and the transmission in the reverse position, the transmission control module (TCM) sends a serial data message to the multiple control modules. The message indicates that the gear selector is in the reverse position. The K9 Body Control Module (BCM) responds to the reverse position message by sending a serial data message to the K219 Lighting Control Module to request the backup lamps on. The Lighting Control Module responds by applying battery voltage to the backup lamps control circuit(s) illuminating the backup lamps. The applied voltage is also sent to the A11 Radio and A10 Inside Rearview Mirror for rearview camera purposes. Once the driver moves the gear selector out of the reverse position, a serial data message is sent by the TCM that the transmission is no longer in the reverse position. The BCM responds to the reverse position message by sending a serial data message to the Lighting Control Module to request the backup lamps off. The Lighting Control Module responds by removing battery voltage from the backup lamp circuits. The engine must be running for the backup lamps to operate.

Cargo Lamps

Cargo Lamps

When the K9 Body Control Module (BCM) receives a task lamp switch input from the S30 Headlamp Switch, the BCM responds by sending a serial data message to the K219 Lighting Control Module. The lighting control module responds by applying pulse width modulated (PWM) voltage to the cargo lamp control circuits illuminating the cargo lamps. In the event that the cargo lamps were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position, the lighting control module will deactivate the cargo lamp control circuits to prevent total battery discharge.

Task Lamps

When the K9 Body Control Module (BCM) receives a task lamp switch input from the S30 Headlamp Switch, the BCM responds by sending a serial data message to the K219 Lighting Control Module. The lighting control module responds by applying pulse width modulated (PWM) voltage to the task lamp control circuits illuminating the task lamps in each outside rearview mirror assembly. When the task lamp switch is pressed a second time, the left task lamp control circuit will stay illuminated while the right side will be turned off. When the task lamp switch is pressed a third time, the left task lamp control circuit will be turned off while the right side will be turned back on. When the task lamp switch is pressed a fourth time, both task lamps will be turned off. In the event that the task lamps were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position, the lighting control module will deactivate the cargo lamp control circuit to prevent total battery discharge.

Approach Lighting

Approach lighting is commanded ON when the unlock button is pressed on the keyless entry transmitter during dark ambient light conditions. When the keyless entry transmitter unlock button is pressed, a serial data message is sent by the K9 Body Control Module (BCM) that the vehicle is being unlocked. The K219 Lighting Control Module responds to the serial data message by applying voltage to the approach lamp control circuit illuminating the LED lighting located under each outside rearview mirror as part of approach lighting.

Battery Run Down Protection/Inadvertent Power

To provide battery run down protection, the exterior lamps will be deactivated automatically under certain conditions. The K9 Body Control Module (BCM) monitors the state of the S30 Headlamp Switch. If the headlamp switch is in the park or headlamp position when the ignition switch is ON and then the ignition switch is placed in the OFF position, the BCM initiates a 10 minutes timer. At the end of the 10 minutes, the BCM will send a serial data message to the K219 Lighting Control Module to deactivate the exterior lamps to prevent total battery discharge. This feature will be cancelled if any power mode other than OFF becomes active.

The BCM will disable battery run down protection if any of the following conditions exist:

- The park or headlamp switch is changed from the ON to OFF position, and back to the ON position during battery run down protection.
- The BCM determined that the park or headlamp switch was not active when the ignition was turned OFF.

Interior Lighting Systems Description and Operation

Interior Lamps

Dome Lamps

The dome lamps are controlled by door ajar inputs to the K9 Body Control Module (BCM). When any door is opened, the door ajar switch contacts close and the BCM receives a door-open input. The BCM responds by sending a serial data message to the A103 Roof Console. The Roof Console responds by applying battery voltage to the dome lamps illuminating the dome lamps. The BCM will also send a serial data message to request the dome lamps on when a door lock/unlock request is activated with the key fob. After all doors have been closed, the dome lamp will remain illuminated approximately 3 seconds after the last door closes. In the event that the dome lamp were to remain illuminated for more than 10 minutes with the ignition switch in the OFF position, the BCM will deactivate the dome lamp control circuit to prevent total battery discharge. The dome lamps will turn OFF using the theater dimming feature when controlled by the BCM.

Center Console Compartment Lamp

The K9 Body Control Module (BCM) supplies battery voltage to the center console lamp through control circuit 4786 anytime the ignition/vehicle is turned on or the dome lamps are requested on through the dome lamp control switch on the A103 Roof Console. In the event that the center console lamp were to remain illuminated for more than 10 minutes with the ignition/vehicle off, the BCM will deactivate the courtesy lamp control circuit to prevent total battery discharge.

Keyless Entry Interior Illumination

When the operator uses the keyless entry transmitter in order to unlock the doors, the K9 Body Control Module (BCM) receives a door-unlock signal. The BCM must receive inputs from various systems that indicate that the ignition switch is OFF, the courtesy lamp switch is OFF, and all doors are closed before the BCM will activate the interior lamps. After all doors have been closed, the courtesy lamps will turn OFF immediately if the ignition switch is turned to the ON position, the door locks are LOCKED, or approximately 20 seconds after the last door closes. The BCM will turn off the courtesy lamps through the theater dimming feature. The BCM keeps the courtesy lamps on for 40 seconds after an alarm event is completed.

Reading Lamps

When a reading lamp button is pressed, the switch contacts close providing a path to ground for the signal circuit from the A103 Roof Console. The roof console responds by applying battery voltage to the appropriate reading lamp control circuit illuminating the reading lamp. If the operator inadvertently leaves a reading lamp ON, the BCM will send a serial data message to turn all interior lighting off after 10 minutes has passed to prevent total battery discharge.

Sunshade Mirror Lamp

The inadvertent power supply voltage circuit from the K9 Body Control Module (BCM) provides battery voltage to the passenger side sunshade mirror lamp. When the sunshade mirror cover is opened, a switch closes providing ground and the sunshade lamp illuminates. If the operator inadvertently leaves the sunshade mirror cover open with the lamp ON, the BCM will turn all interior lamps OFF after 10 minutes has passed to prevent total battery discharge.

Interior Lamps Dimming

With the S30 Headlamp Switch in the PARK or HEAD position, the park lamp switch signal circuit provides an input to the K9 Body Control Module (BCM). The BCM responds by applying voltage to the backlight dimming control circuits illuminating all components with interior backlighting. All interior backlighting turns on at the dimming level set by the dimmer buttons within the headlamp switch. The headlamp switch is used to increase and decrease the brightness of the interior backlighting components. The BCM provides a signal circuit and a low reference circuit to the headlamp switch for backlight dimming. When a dimming button is pressed, the signal circuit becomes grounded through the appropriate resistor internal to the headlight switch and voltage from the BCM will decrease accordingly. The BCM interprets the signal and responds in two ways. The BCM applies a pulse width modulated (PWM) voltage through the LED dimming control circuits illuminating the interior backlighting to the requested level of brightness. The BCM also sends a serial data message to the appropriate control modules requesting all dimming components to be illuminated to the same level of brightness.

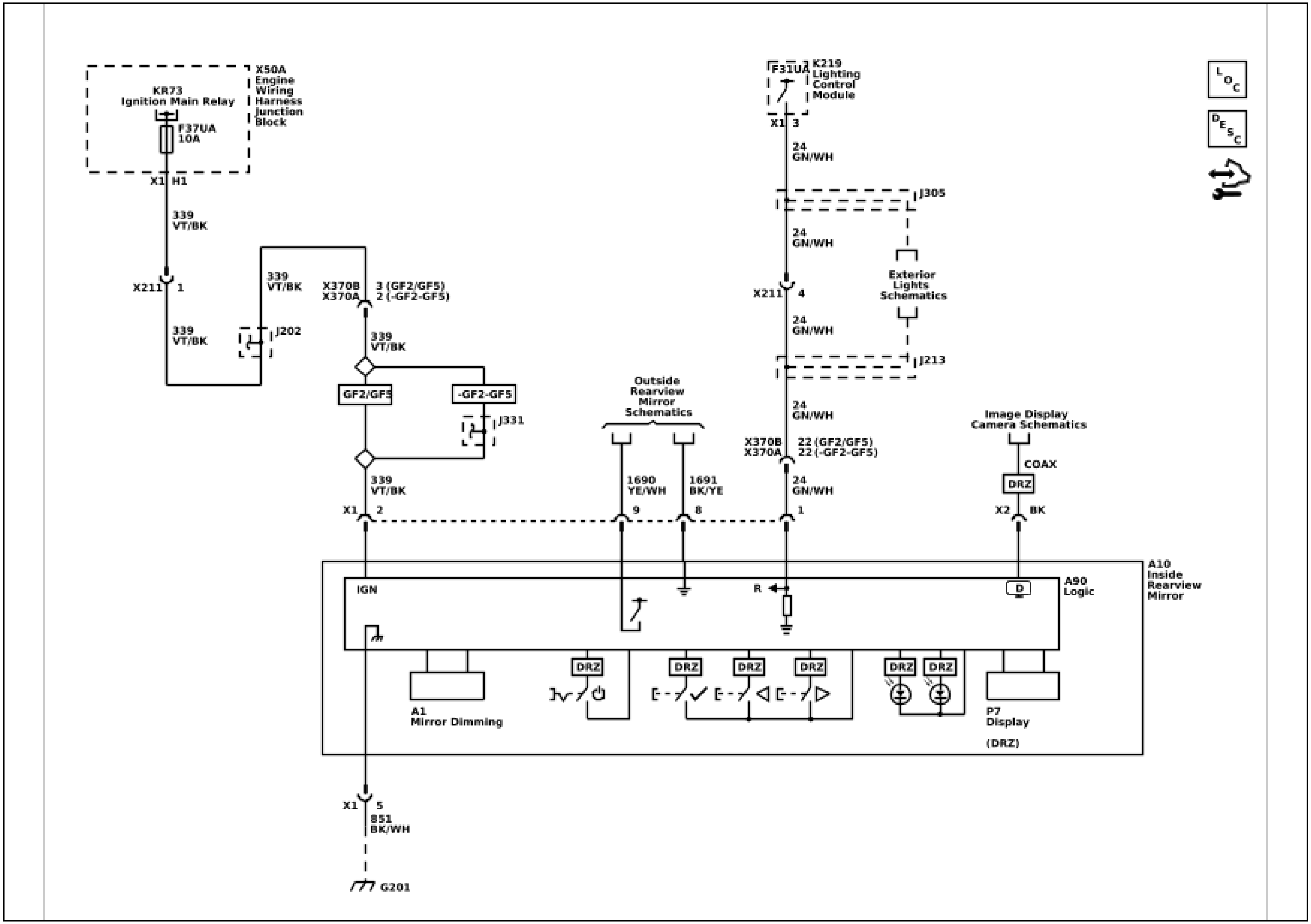
Battery Rundown Protection/Inadvertent Power

The K9 Body Control Module (BCM) inadvertent power supply voltage circuit provides battery voltage to all of the interior courtesy lamps. In the event that any of these lamps were to remain illuminated for a period of more than 10 minutes with the ignition switch in the OFF position, the BCM will deactivate the inadvertent power supply voltage circuit to prevent total battery discharge. If the ignition switch is turned to any position other than OFF, or if a lamp switch is activated during this 10 minute period, the timer resets for another 10 minutes.

Mirrors

Schematic and Routing Diagrams

Inside Rearview Mirror Schematics (Inside Rearview Mirror (DD8 / DRZ))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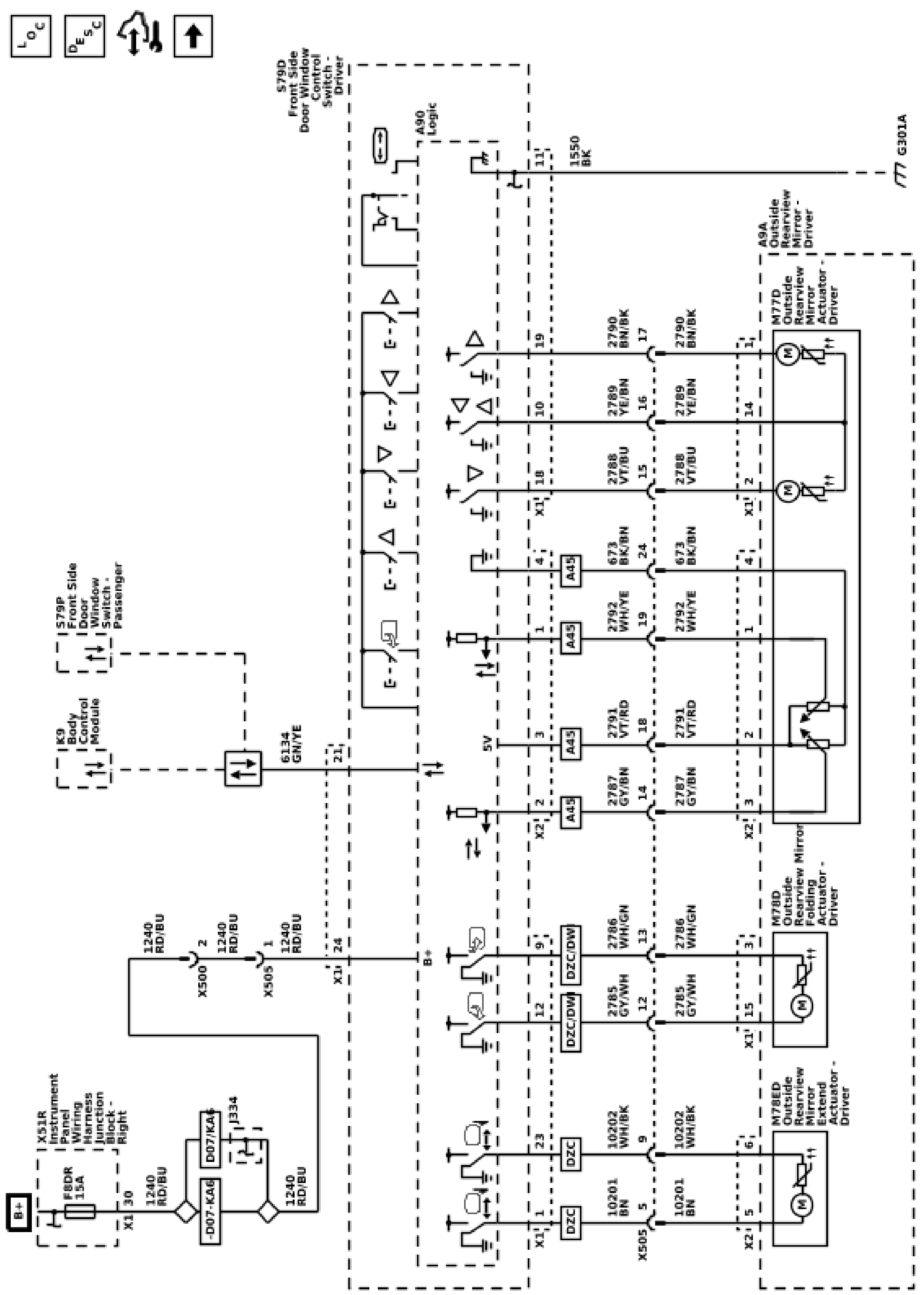
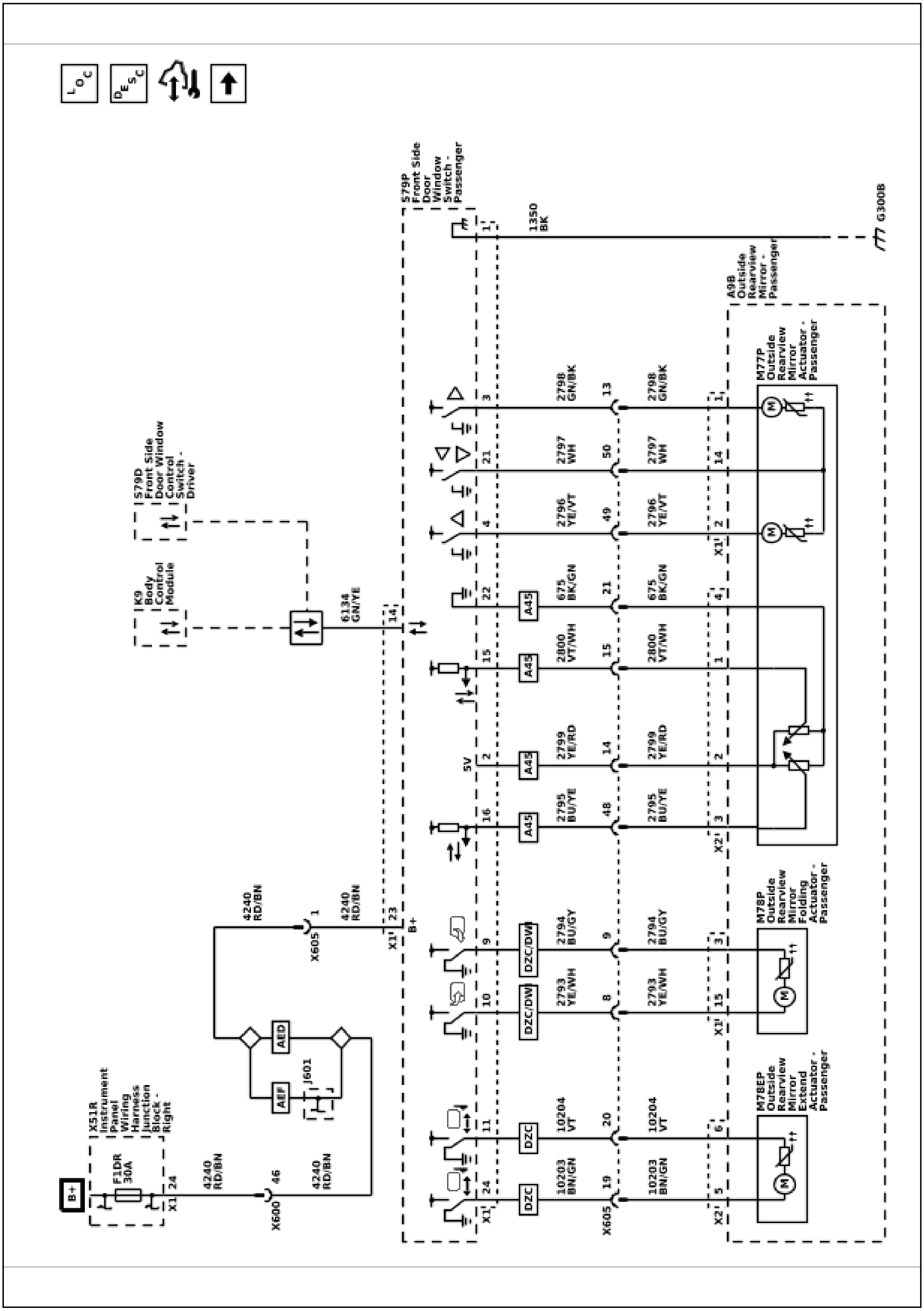
KR73 Ignition Main Relay
F37UA 10A
X1 H1
339 VT/BK
X211 1
339 VT/BK
J202
339 VT/BK
X370B X370A
3 (GF2/GF5)
2 (-GF2-GF5)
339 VT/BK
GF2/GF5
-GF2-GF5
J331
339 VT/BK
X1 2
F31UA
K219 Lighting Control Module
X1 3
24 GN/WH
J305
24 GN/WH
X211 4
Exterior Lights Schematics
24 GN/WH
J213
24 GN/WH
X370B X370A
22 (GF2/GF5)
22 (-GF2-GF5)
24 GN/WH
X1 1
Outside Rearview Mirror Schematics
1690 YE/WH
9
1691 BK/YE
8
Image Display Camera Schematics
COAX
DRZ
X2 BK
A10 Inside Rearview Mirror
A90 Logic
IGN
R
D
DRZ
DRZ
DRZ
DRZ
DRZ
DRZ
A1 Mirror Dimming
P7 Display
(DRZ)
X1 5
851 BK/WH
G201

6846192

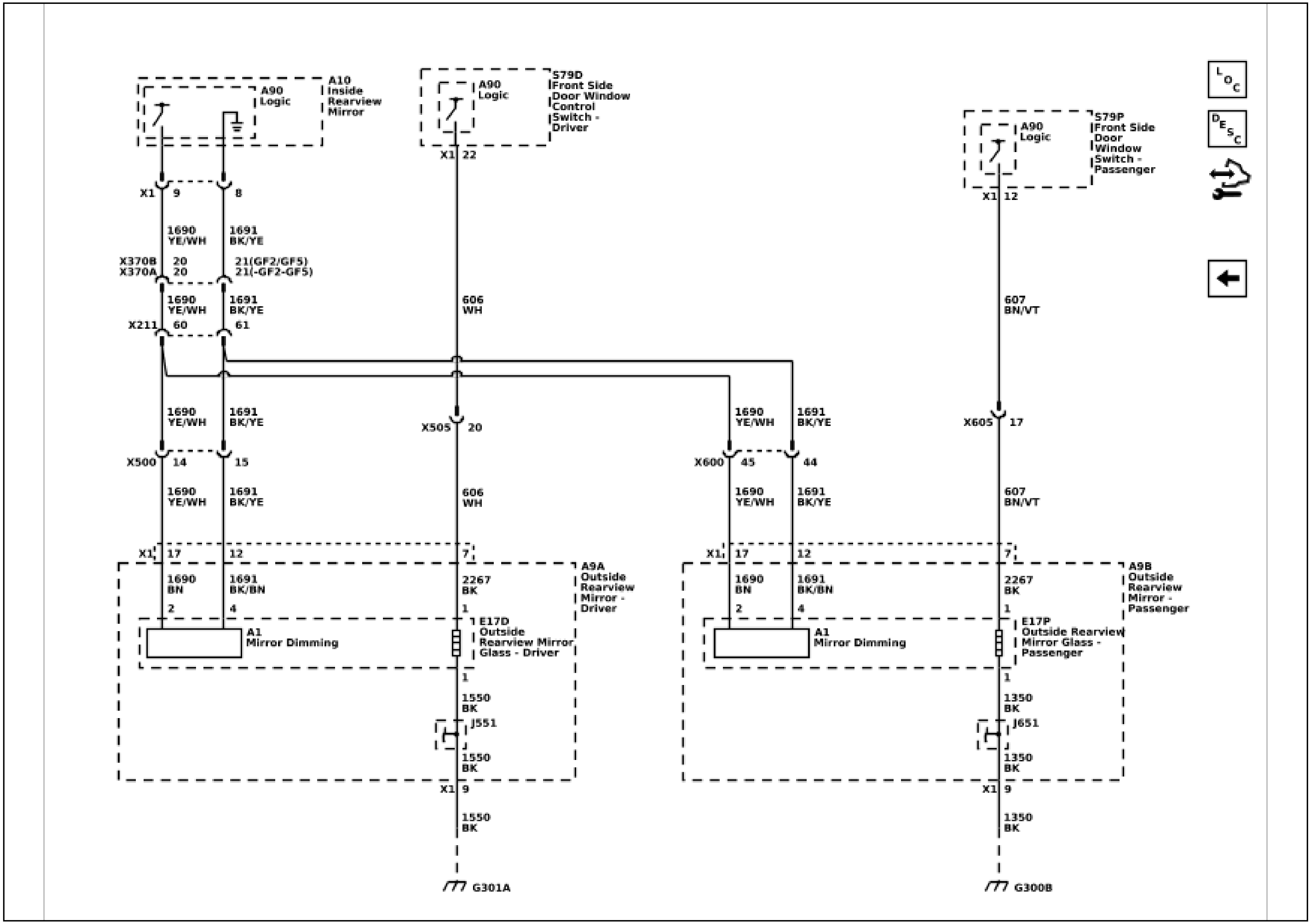
Outside Rearview Mirror Schematics (Driver Controls, Position, and Folding (DWI / DZC))


6846193
LOC
DESC
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F8DR 15A
X1 30
1240 RD/BU
-D07-KA6
D07/KA6
J334
X500 2
X505 1
X1 24
B+
K9 Body Control Module
S79P Front Side Door Window Switch - Passenger
6134 GN/YE
21
S79D Front Side Door Window Control Switch - Driver
A90 Logic
5V
11
1550 BK
G301A
X1 1 23 12 9 18 10 19
X2 2 3 1 4
DZC
DZC/DW
A45
10201 BN
10202 WH/BK
2785 GY/WH
2786 WH/GN
2787 GY/BN
2791 VT/RD
2792 WH/YE
673 BK/BN
2788 VT/BU
2789 YE/BN
2790 BN/BK
X505 5 9 12 13 14 18 19 24 15 16 17
X2 5 6 3 2 1 4
X1 15 3 2 14 1
A9A Outside Rearview Mirror - Driver
M78ED Outside Rearview Mirror Extend Actuator - Driver
M78D Outside Rearview Mirror Folding Actuator - Driver
M77D Outside Rearview Mirror Actuator - Driver
M

Outside Rearview Mirror Schematics (Passenger Controls, Position, and Folding (DWI / DZC))


B+
F1DR
30A
X51R
Instrument
Panel
Wiring
Harness
Junction
Block -
Right
X1 24
4240
RD/BN
X600 46
4240
RD/BN
AEF
AED
J601
4240
RD/BN
X605 1
4240
RD/BN
X1' 23
B+
K9
Body
Control
Module
S79D
Front Side
Door Window
Control
Switch -
Driver
6134
GN/YE
14
S79P
Front Side
Door
Window
Switch -
Passenger
1'
1350
BK
G300B
X1' 24 11 10 9 16 2 15 22 4 21 3
5V
DZC
DZC
DZC/DWI
DZC/DWI
A45
A45
A45
A45
10203
BN/GN
10204
VT
2793
YE/WH
2794
BU/GY
2795
BU/YE
2799
YE/RD
2800
VT/WH
675
BK/GN
2796
YE/VT
2797
WH
2798
GN/BK
X605 19 20 8 9 48 14 15 21 49 50 13
10203
BN/GN
10204
VT
2793
YE/WH
2794
BU/GY
2795
BU/YE
2799
YE/RD
2800
VT/WH
675
BK/GN
2796
YE/VT
2797
WH
2798
GN/BK
X2' 5 6
X1' 15
3
X2' 3 2 1
4
X1' 2 14 1
M78EP
Outside
Rearview
Mirror
Extend
Actuator -
Passenger
M78P
Outside
Rearview
Mirror
Folding
Actuator -
Passenger
M77P
Outside
Rearview
Mirror
Actuator -
Passenger
A9B
Outside
Rearview
Mirror -
Passenger
M
6846194

Outside Rearview Mirror Schematics (Dimming and Heating (DD8 / DRZ))


A10
Inside
Rearview
Mirror
A90
Logic
S79D
Front Side
Door Window
Control
Switch -
Driver
S79P
Front Side
Door
Window
Switch -
Passenger
X1 9
8
X1 22
X1 12
1690
YE/WH
1691
BK/YE
X370B 20
X370A 20
21(GF2/GF5)
21(-GF2-GF5)
X211 60
61
606
WH
607
BN/VT
X505 20
X605 17
X500 14
15
X600 45
44
X1 17
12
7
1690
BN
1691
BK/BN
2267
BK
2
4
1
A1
Mirror Dimming
E17D
Outside
Rearview Mirror
Glass - Driver
E17P
Outside Rearview
Mirror Glass -
Passenger
A9A
Outside
Rearview
Mirror -
Driver
A9B
Outside
Rearview
Mirror -
Passenger
1550
BK
J551
1350
BK
J651
X1 9
G301A
G300B

6846195

Description and Operation

Automatic Day-Night Mirror Description and Operation

Inside Rearview Mirror with the Automatic Day-Night Feature System Operation

The inside rearview mirror uses 2 photocell sensors. One sensor is the headlight sensor, located on the face side of the mirror. The headlight sensor is used to determine light conditions present at the mirror face. The other sensor is the ambient light sensor, located on the rear of the mirror or windshield side. The ambient light sensor is used to determine the exterior light conditions. With a low exterior light condition detected, and a high light condition from behind the car at the headlight sensor, the inside rearview mirror will automatically darken the face of the mirror.

In the daytime, the mirror is in a normal state because of the high exterior light condition that is indicated by the ambient light sensor. With the gear selector lever in the REVERSE position and the Ignition ON/Vehicle in Service Mode, backup lamp supply voltage is supplied as an input to the inside rearview mirror. The mirror monitors this input to disable the automatic day-night feature. This allows the driver to see objects in the mirror clearly when backing up, even during the night.

Driver Outside Rearview Mirror with Automatic Day-Night System Operation (If Equipped)

The automatic day-night feature of the driver outside rearview mirror is controlled by the inside rearview mirror. The inside rearview mirror supplies control and low reference to the driver outside rearview mirror. At night, with the automatic day-night feature enabled, the driver outside rearview mirror will automatically darken with the inside rearview mirror to reduce glare from headlamps behind the vehicle.

Inside Rearview Camera Full Display Mirror System Operation

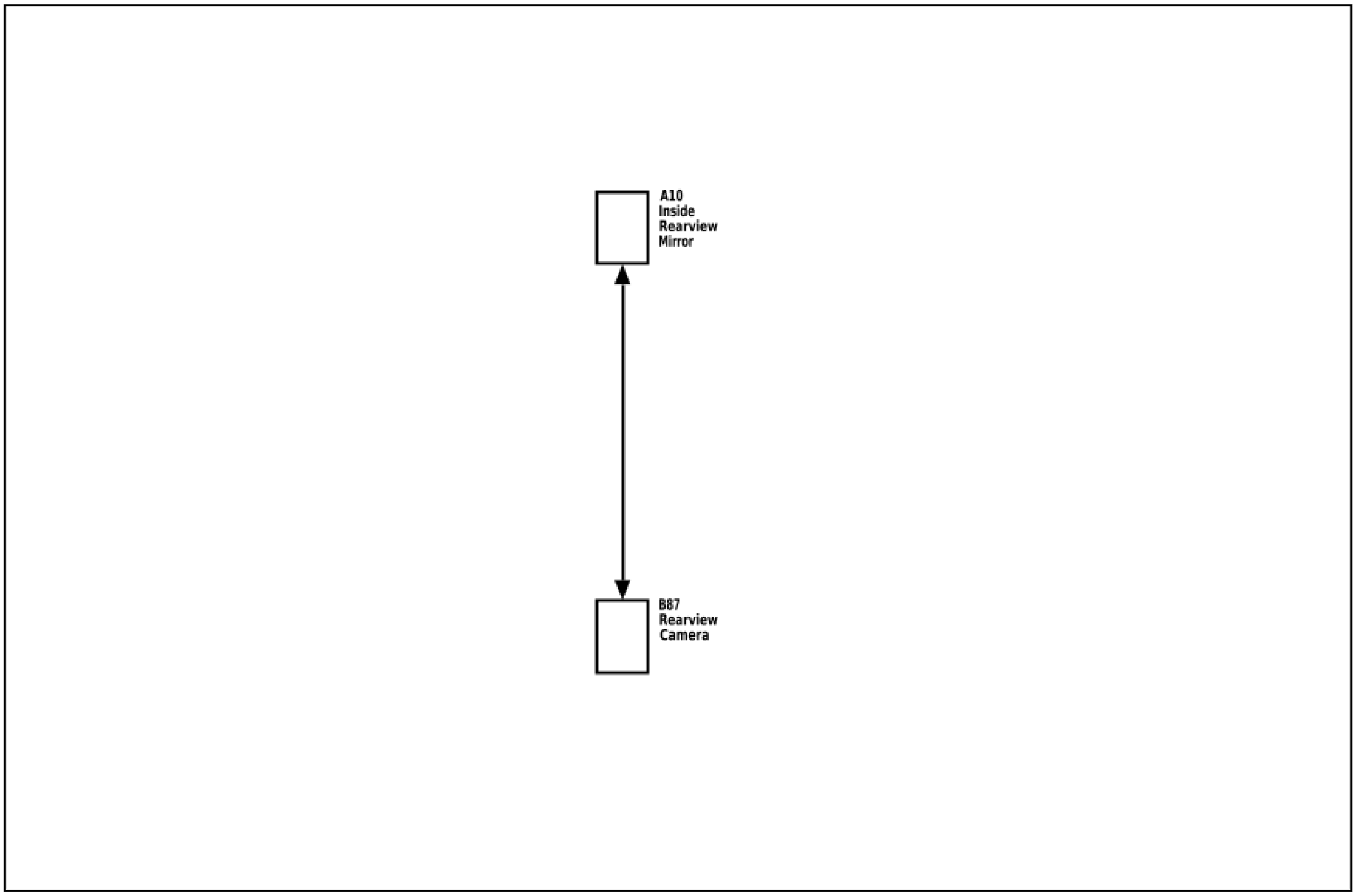
The A10 Inside Rearview Mirror is connected to the B352 Video Display inside Rearview Mirror Camera via a shielded coaxial cable. When the tab under the inside rearview mirror is pulled rearward, a view of the area behind the vehicle displays on the mirror. Adjust the rearview mirror for a clear view of the area behind the vehicle before turning on full display mirror. Use the button on the back of the mirror to adjust the brightness of the display. Make sure the light sensor is not covered when adjusting the brightness.

The inside rearview camera full display mirror may not work properly or display a clear image if:.

- It is dark.
- The sun or the beam of headlamps are shining directly into the camera lens.
- Ice, snow, mud, or anything else builds up on the camera lens. Clean the lens, rinse it with water, and wipe it with a soft cloth.

When the mirror detects that the camera is not sending a valid video signal, it “blue screens” with a “no video” decal for 3 seconds, then reverts back to the mirror.

Rearview Camera Full Display Mirror Block Diagram



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Hard-Wired

A10 Inside Rearview Mirror

B87 Rearview Camera

Outside Mirror Description and Operation

Power Mirror System Components

The power mirror system consists of the following components:

- Body Control Module
- Driver Seat Adjuster Memory Module
- Outside Mirror Switch
- Passenger Window Switch
- Left Outside Rearview Mirror
- Right Outside Rearview Mirror

Power Mirror System Controls

The outside rearview mirror switch is part of the S79D Driver Front Side Door Window Control Switch and uses serial data to control the passenger mirror through the S79P Passenger Front Side Door Window Control Switch. Each S79 Side Door Window Control Switch has it own 12V, ground and data communications circuit along with mirror directional control and mirror fold circuits.

Driver Mirror Controls

The S79D Driver Front Side Door Window Control Switch has internal connections for the driver mirror. When the mirror position switch is active the driver mirror is commanded to move through bi-directional motor control circuits. The motor control circuits are floating while in an inactive state and the switches will apply power and ground to the control circuits as necessary to move the mirror in the commanded direction.

Passenger Mirror Controls

The S79D Driver Front Side Door Window Control Switch uses serial data circuits to communicate the active states for the passenger mirror switch to the S79P Passenger Front Side Door Window Control Switch. The S79P Passenger Front Side Door Window Control Switch has internal connections for the passenger mirror. When the mirror position switch is active the passenger mirror is commanded to move through bi-directional motor control circuits. The motor control circuits are floating while in an inactive state and the switches will apply power and ground to the control circuits as necessary to move the mirror in the commanded direction.

Mirror Position

Mirror position is determined by both horizontal and vertical position sensors in each of the power mirrors. Each S79 Front Side Door Window Control Switch supplies a 5 V reference, low reference, and horizontal and vertical position signal circuits to these sensors. The signal circuits are referenced from 5 V by the S79 Front Side Door Window Control Switch and the signal circuit voltage levels represent the mirror positions. The mirror positions are stored in each S79 Front Side Door Window Control Switch for memory mirror operation. When the memory seat module receives a memory recall command, the memory seat control module will send the go to position to the S79 Front Side Door Window Control Switch. The S79 Front Side Door Window Control Switches will then drive the appropriate mirror motors to the commanded position sensor settings.

Mirror Select

The S79D Driver Front Side Door Window Control Switch has internal connections for the mirror select switch. When the mirror select switch is active the S79 Front Side Door Window Control Switch will either control the driver mirror or send a serial data message to control the passenger mirror.

Folding Mirrors

The S79D Driver Front Side Door Window Control Switch sends the mirror fold/unfold inputs to the K9 Body Control Module (BCM) through serial data. When the BCM receives a fold/unfold signal it will send a fold/unfold command to the S79 Driver Front Side Door Window Control Switch which will send a serial data message to the S79P Passenger Front Side Door Window Control Switch. The outside mirrors will fold or unfold depending on their current state. The BCM will also send a serial data message to unfold the mirrors when the vehicle reaches 20 km/h (12 mph) unless equipped with camper/trailer mirrors. The S79 Front Side Door Window Control Switches control the fold/unfold motors through bi-directional control circuits

Heated Mirrors

The heated mirrors are controlled through each S79 Front Side Door Window Control Switch. When the vehicle is running and the HVAC control module receives a rear window defog request from the radio/HVAC controls, the HVAC control module will send a serial data message to the S79D Driver Front Side Door Window Control Switch and S79P Passenger Front Side Door Window Control Switch. Each S79 Front Side Door Window Control Switch provide B+ voltage to the driver and passenger outside rearview mirror heating elements.

Memory Mirror System

Memory Mirror System Controls

The K40D Driver Seat Adjuster Memory Module is capable of storing mirror positions and controlling the mirrors to these positions to the preferred settings of 2 different drivers. Each driver will be able to personalize the memory system by positioning the mirrors and seats to their preferred settings. Then press and hold the memory 1 or memory 2 button until an audible chime is heard and the current mirror positions will be stored into memory of the K40D Driver Seat Adjuster Memory Module. Seat and mirror position will be stored in the K40D Driver Seat Adjuster Memory Module. Once the mirror and seat positions have been stored into memory, a momentary memory 1 or memory 2 switch activation will supply the S79D Front Side Door Window Control Switch — Driver a battery voltage signal. The S79D Front Side Door Window Control Switch — Driver, upon receipt of the memory switch signal, with the transmission in park or neutral, will then drive the driver mirror to the corresponding stored memory position. The S79D Front Side Door Window Control Switch — Driver will also send a message to the S79P Front Side Door Window Switch — Passenger and K40D Driver Seat Adjuster Memory Module indicating that a memory switch activation occurred. The S79P Front Side Door Window Switch — Passenger will then drive the passenger mirror to the corresponding stored memory position. The memory system can also be controlled by any of the following, if programmed to enable/disable the features:

- Auto exit/entry seat positioning
- Mirror and seat position recall on a keyless entry unlock activation
- Mirror and seat position recall on ignition key insertion
- Mirror tilt in reverse

Memory Mirror System Operation

Mirror position is determined by both horizontal and vertical position sensors in each of the power mirrors. The S79D Front Side Door Window Control Switch — Driver and S79P Front Side Door Window Switch —

Passenger supplies a reference voltage and a low reference to these sensors and determines mirror position through the horizontal and vertical position signal circuits.

The memory switch receives power from the S79D Front Side Door Window Control Switch — Driver through the battery supply voltage circuit and the S79D Front Side Door Window Control Switch — Driver fuse. The S79D Front Side Door Window Control Switch — Driver upon receipt of a memory switch signal input or an appropriate message from the K40D Driver Seat Adjuster Memory Module, the S79D Front Side Door Window Control Switch — Driver and S79P Front Side Door Window Switch — Passenger will then supply battery voltage and ground to the appropriate power mirror motors through the mirror motor control circuits to move the mirrors to the predetermined positions.

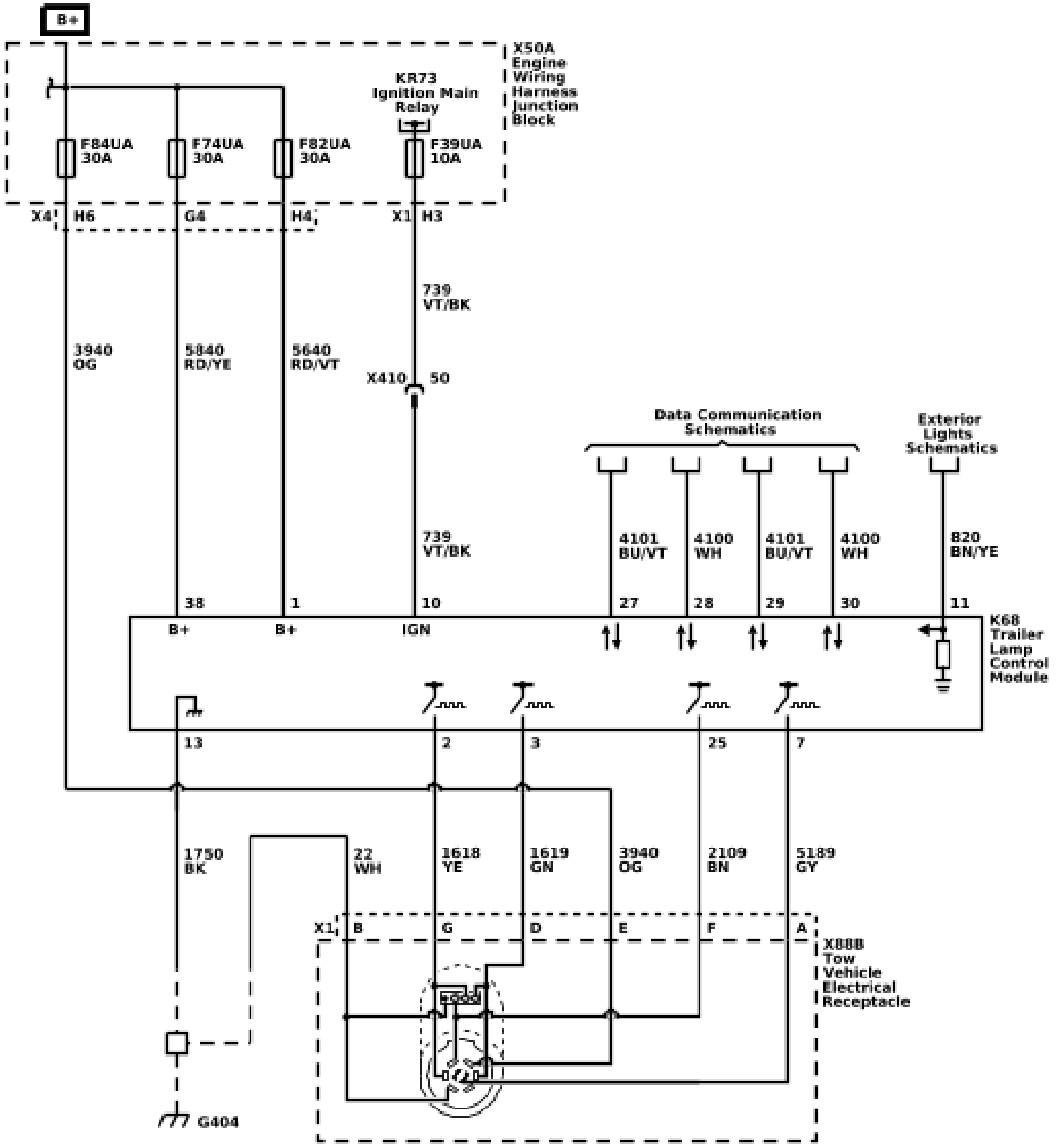
Mirror Tilt in Reverse Controls
This feature is capable of tilting the left, right or both power mirrors when the transmission is placed in reverse to provide enhanced visibility during parking or backing maneuvers. This feature can be personalized to the needs of 2 different drivers.

Mirror Tilt in Reverse Operation
When the vehicle is placed in reverse and the appropriate message from the K40D Driver Seat Adjuster Memory Module and K20 Engine Control Module is received by the S79D Front Side Door Window Control Switch — Driver and S79P Front Side Door Window Switch — Passenger, the S79D Front Side Door Window Control Switch — Driver and S79P Front Side Door Window Switch — Passenger will then supply battery voltage to the appropriate power mirror motors through the mirror motor control circuits to move the mirrors to the predetermined positions. The positions that are stored can be altered by starting the engine, applying the brake, placing the vehicle in reverse and controlling both the left and right mirrors to the desired positions and shifting the vehicle out of reverse. These new positions will be stored for the last memory recall that happened.

Trailering Systems

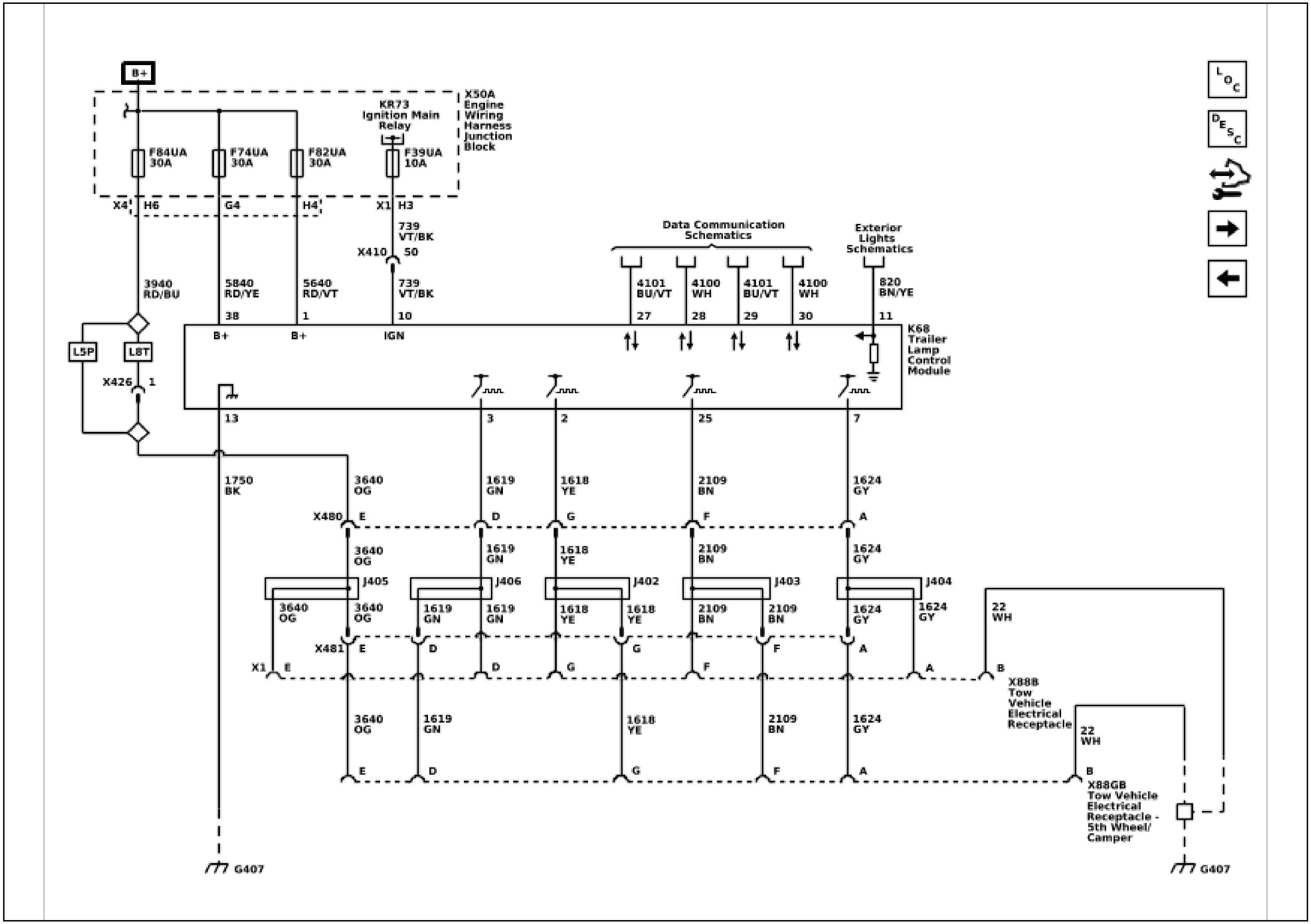
Schematic and Routing Diagrams

Trailering Systems Schematics (Trailer Lighting Control Module (Z82 & UET - (UY2 / Z6A)))


B+
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F84UA 30A
F74UA 30A
F82UA 30A
F39UA 10A
X4 H6
G4
H4
X1 H3
3940 OG
5840 RD/YE
5640 RD/VT
739 VT/BK
X410 50
739 VT/BK
Data Communication Schematics
Exterior Lights Schematics
4101 BU/VT
4100 WH
4101 BU/VT
4100 WH
820 BN/YE
38
1
10
27
28
29
30
11
B+
B+
IGN
K68 Trailer Lamp Control Module
13
2
3
25
7
1750 BK
22 WH
1618 YE
1619 GN
3940 OG
2109 BN
5189 GY
X1 B
G
D
E
F
A
X88B Tow Vehicle Electrical Receptacle
G404

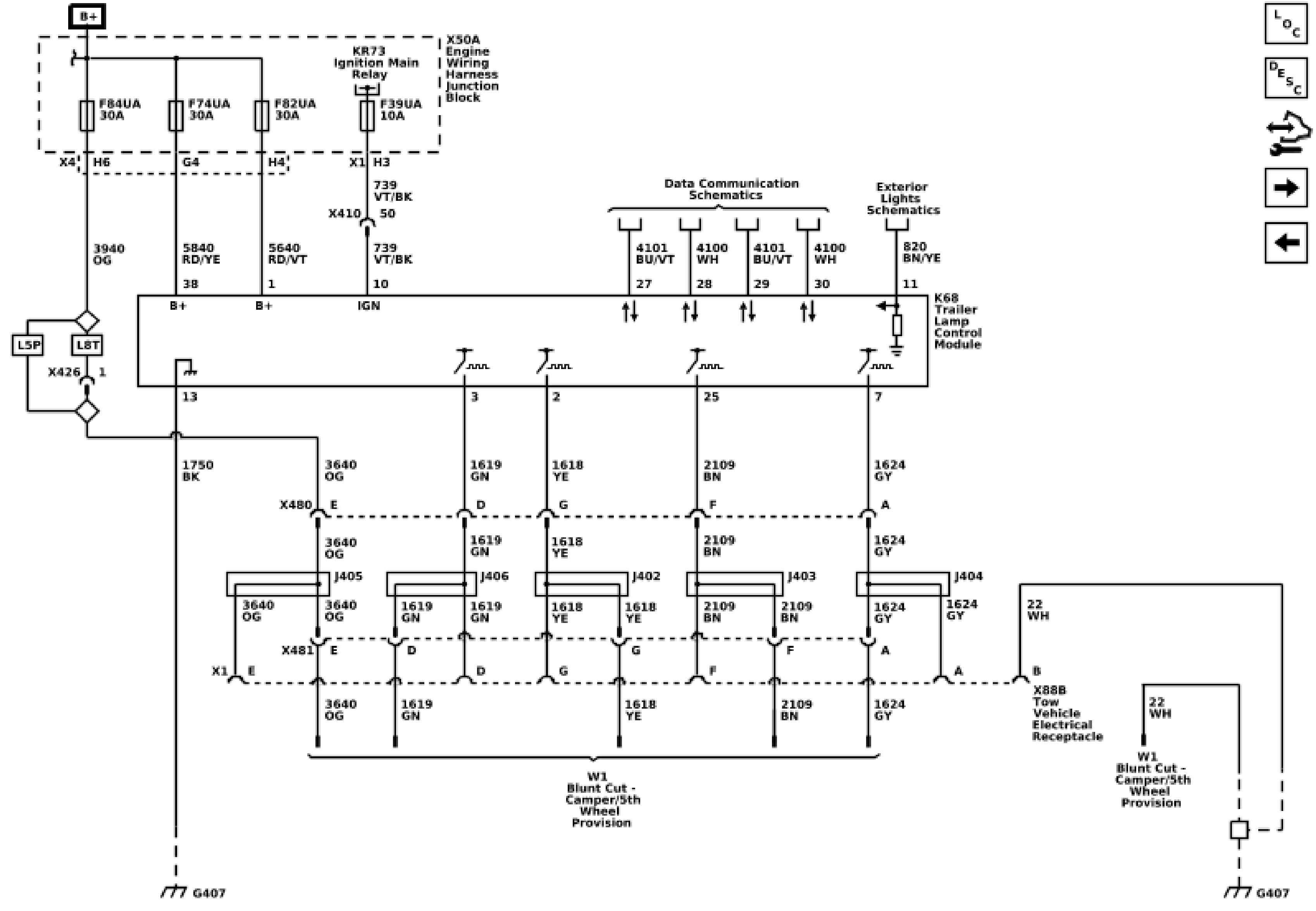
6846401

Trailering Systems Schematics (Trailer Lighting Control Module (Z82 & UET & Z6A))


B+
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F84UA 30A
F74UA 30A
F82UA 30A
F39UA 10A
X4 H6
G4
H4
X1 H3
739 VT/BK
X410 50
739 VT/BK
3940 RD/BU
5840 RD/YE
5640 RD/VT
L5P
L8T
X426 1
38 B+
1 B+
10 IGN
Data Communication Schematics
4101 BU/VT
4100 WH
4101 BU/VT
4100 WH
27
28
29
30
Exterior Lights Schematics
820 BN/YE
11
K68 Trailer Lamp Control Module
13
3
2
25
7
1750 BK
3640 OG
1619 GN
1618 YE
2109 BN
1624 GY
X480 E
D
G
F
A
J405
J406
J402
J403
J404
X481 E
X1 E
22 WH
B
X88B Tow Vehicle Electrical Receptacle
X88GB Tow Vehicle Electrical Receptacle - 5th Wheel/ Camper
G407
G407

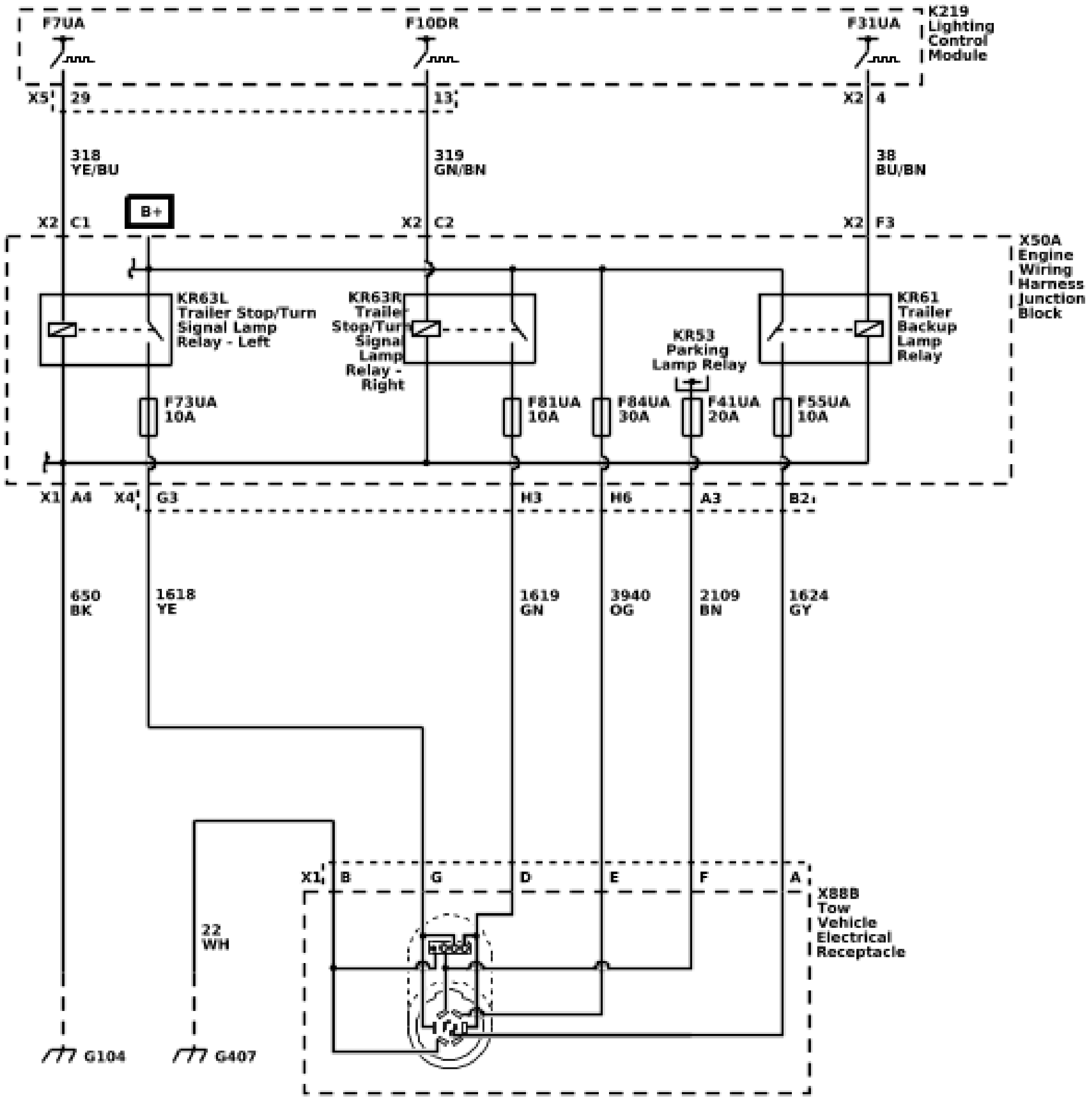
6846402

Trailering Systems Schematics (Trailer Lighting Control Module (Z82 & UET & UY2))


B+
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F84UA 30A
F74UA 30A
F82UA 30A
F39UA 10A
X4 H6
G4
H4
X1 H3
739 VT/BK
X410 50
739 VT/BK
3940 OG
5840 RD/YE
5640 RD/VT
38
1
10
B+
B+
IGN
Data Communication Schematics
4101 BU/VT
4100 WH
4101 BU/VT
4100 WH
27
28
29
30
Exterior Lights Schematics
820 BN/YE
11
K68 Trailer Lamp Control Module
L5P
L8T
X426 1
13
3
2
25
7
1750 BK
3640 OG
1619 GN
1618 YE
2109 BN
1624 GY
X480 E
D
G
F
A
J405
J406
J402
J403
J404
X481 E
X1 E
22 WH
B
X88B Tow Vehicle Electrical Receptacle
W1 Blunt Cut - Camper/5th Wheel Provision
G407
G407

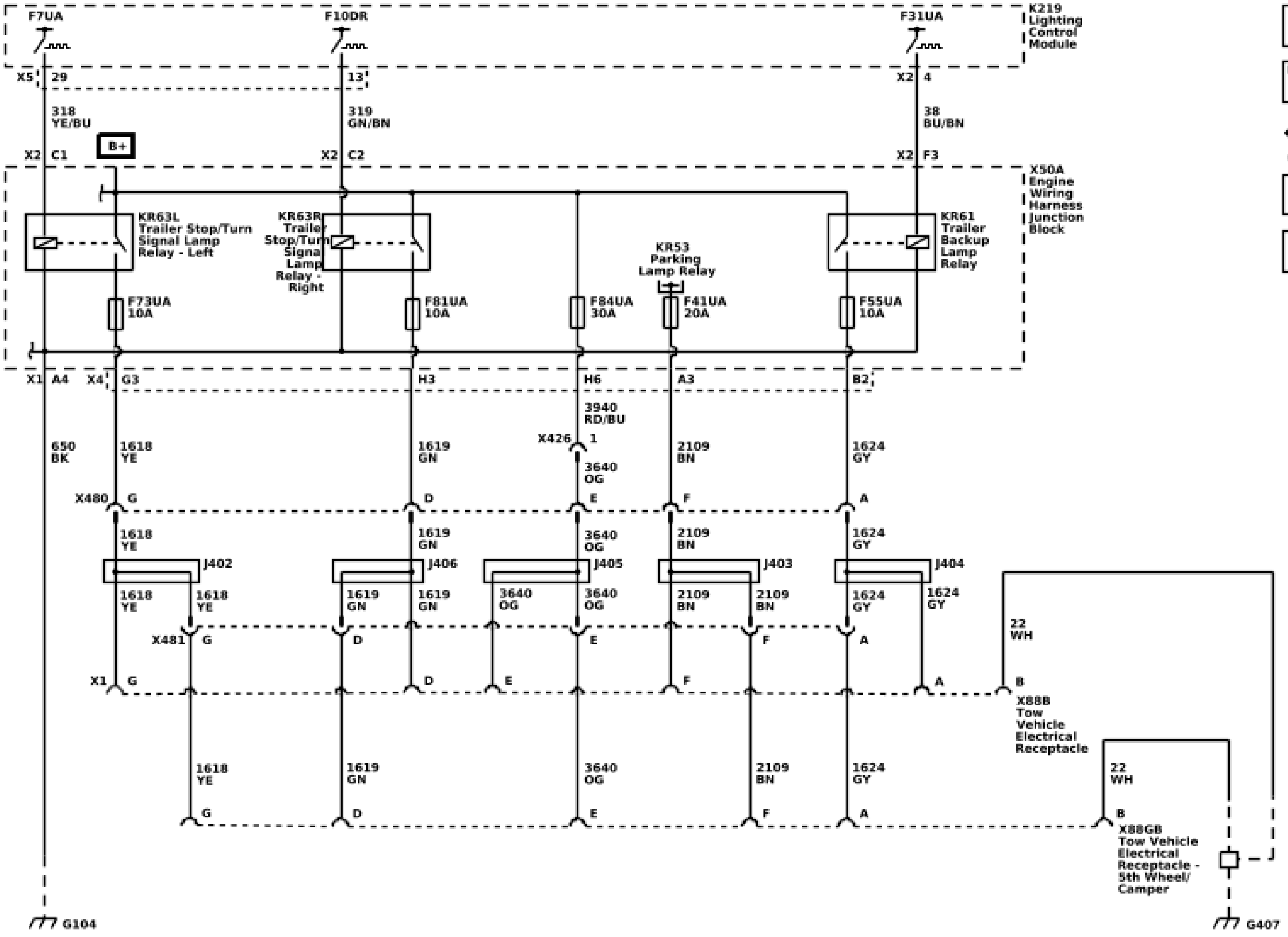
6846403

Trailering Systems Schematics (Trailer Connector Pins: A, B, D, E, F, G (Z82 - (UET / UY2 / Z6A)))


F7UA
F10DR
F31UA
K219 Lighting Control Module
X5 29
13
X2 4
318 YE/BU
319 GN/BN
38 BU/BN
B+
X2 C1
X2 C2
X2 F3
X50A Engine Wiring Harness Junction Block
KR63L Trailer Stop/Turn Signal Lamp Relay - Left
KR63R Trailer Stop/Turn Signal Lamp Relay - Right
KR53 Parking Lamp Relay
KR61 Trailer Backup Lamp Relay
F73UA 10A
F81UA 10A
F84UA 30A
F41UA 20A
F55UA 10A
X1 A4
X4 G3
H3
H6
A3
B2
650 BK
1618 YE
1619 GN
3940 OG
2109 BN
1624 GY
22 WH
X1 B
G
D
E
F
A
X88B Tow Vehicle Electrical Receptacle
G104
G407

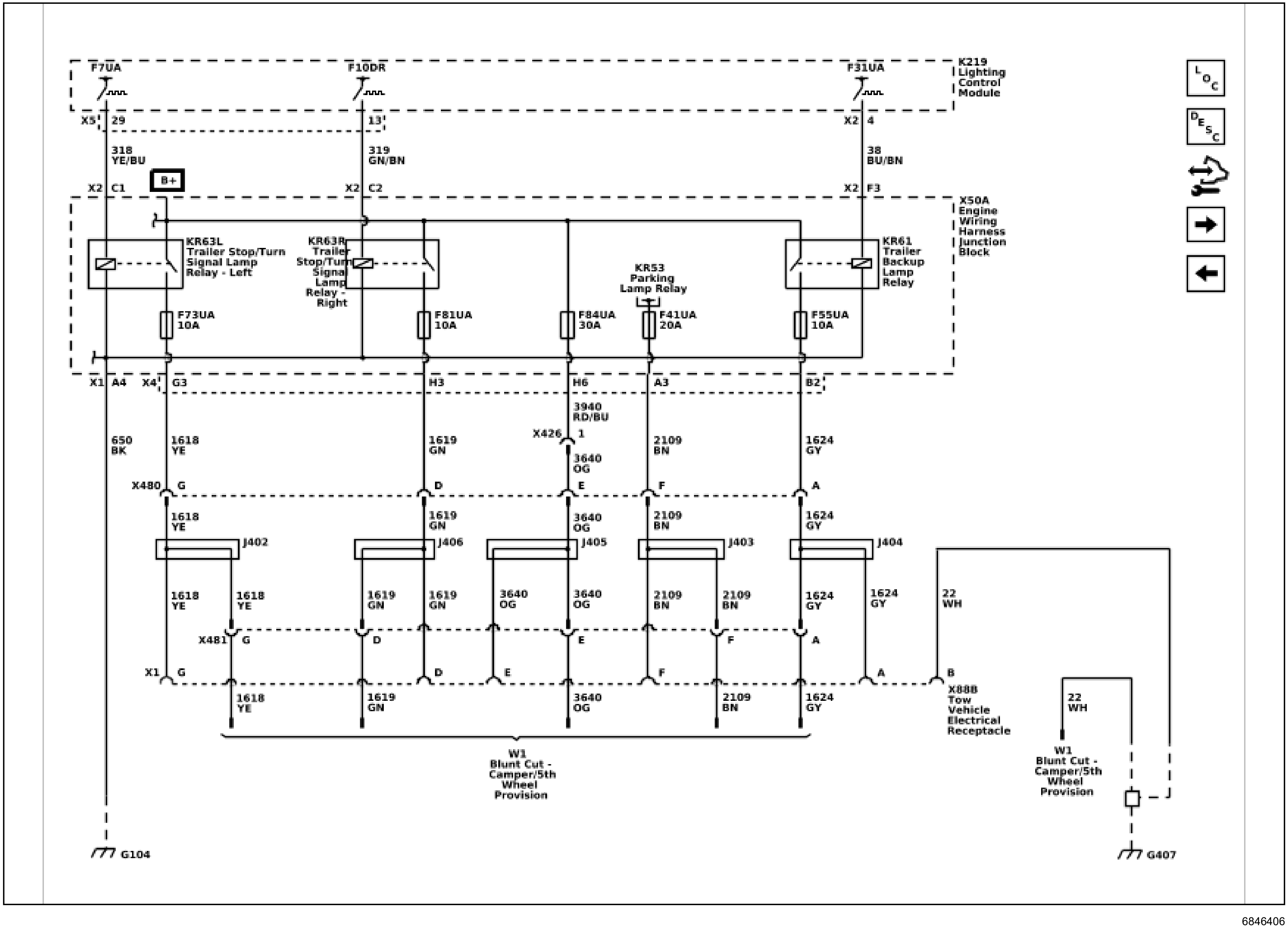
6846404

Trailering Systems Schematics (Trailer Connector Pins: A, B, D, E, F, G (Z82 & Z6A - (UET / UY2)))

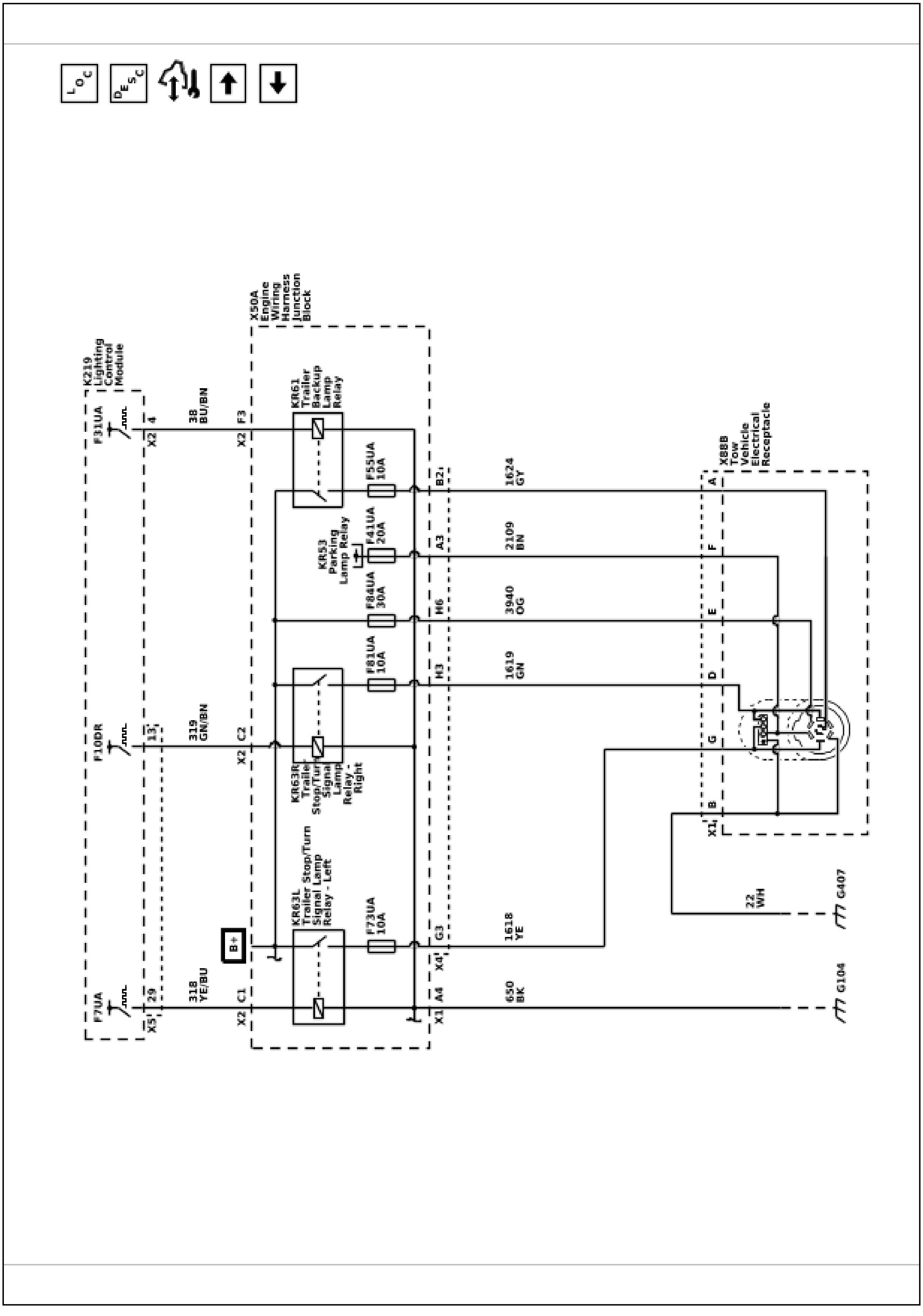

K219 Lighting Control Module
F7UA
F10DR
F31UA
X5 29
13
X2 4
318 YE/BU
319 GN/BN
38 BU/BN
B+
X2 C1
X2 C2
X2 F3
X50A Engine Wiring Harness Junction Block
KR63L Trailer Stop/Turn Signal Lamp Relay - Left
KR63R Trailer Stop/Turn Signal Lamp Relay - Right
KR53 Parking Lamp Relay
KR61 Trailer Backup Lamp Relay
F73UA 10A
F81UA 10A
F84UA 30A
F41UA 20A
F55UA 10A
X1 A4
X4 G3
H3
H6
A3
B2
650 BK
1618 YE
1619 GN
3940 RD/BU
X426 1
3640 OG
2109 BN
1624 GY
X480 G
D
E
F
A
J402
J406
J405
J403
J404
22 WH
X481 G
X1 G
B
X88B Tow Vehicle Electrical Receptacle
X88GB Tow Vehicle Electrical Receptacle - 5th Wheel/ Camper
G104
G407

6846405

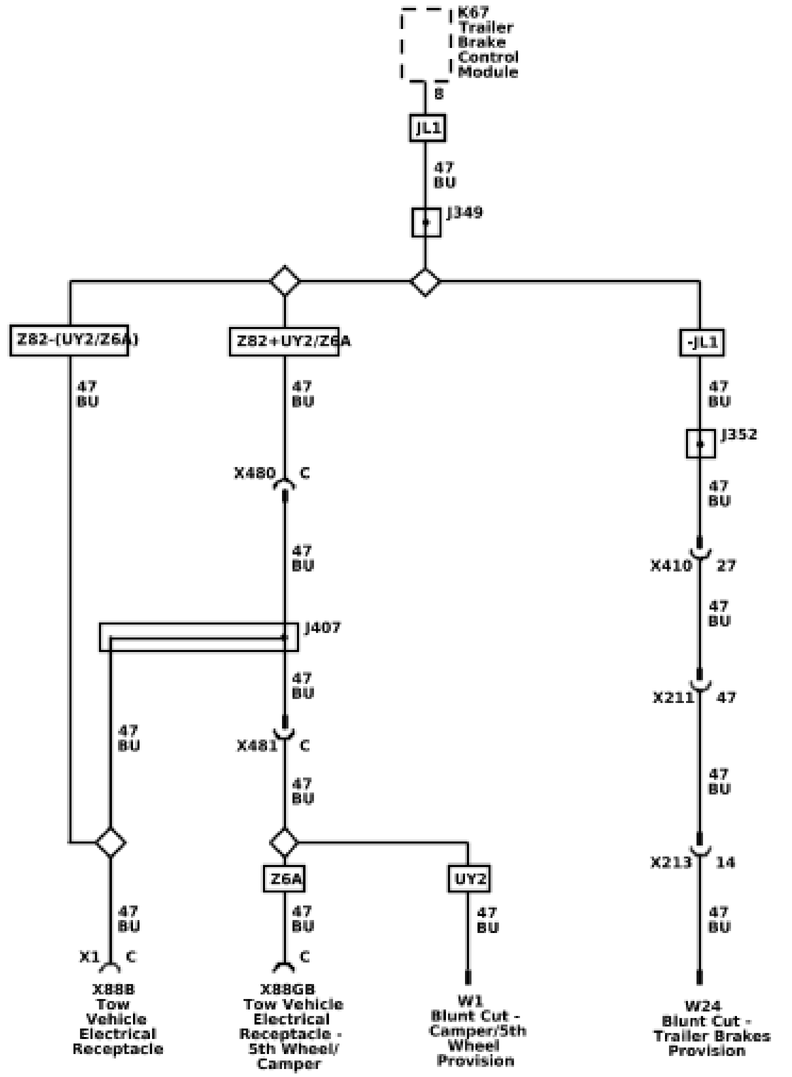
Trailering Systems Schematics (Trailer Connector Pins: A, B, D, E, F, G (Z82 & UY2 - (UET / Z6A)))


F7UA
F10DR
F31UA
K219 Lighting Control Module
X5 29
13
X2 4
318 YE/BU
319 GN/BN
38 BU/BN
B+
X2 C1
X2 C2
X2 F3
X50A Engine Wiring Harness Junction Block
KR63L Trailer Stop/Turn Signal Lamp Relay - Left
KR63R Trailer Stop/Turn Signal Lamp Relay - Right
KR53 Parking Lamp Relay
KR61 Trailer Backup Lamp Relay
F73UA 10A
F81UA 10A
F84UA 30A
F41UA 20A
F55UA 10A
X1 A4
X4 G3
H3
H6
A3
B2
3940 RD/BU
X426 1
650 BK
1618 YE
1619 GN
3640 OG
2109 BN
1624 GY
X480 G
D
E
F
A
J402
J406
J405
J403
J404
22 WH
X481 G
X1 G
B
X88B Tow Vehicle Electrical Receptacle
W1 Blunt Cut - Camper/5th Wheel Provision
G104
G407
6846406

Trailering Systems Schematics (Trailer Connector Pins: A, B, D, E, F, G - Chassis Cab)

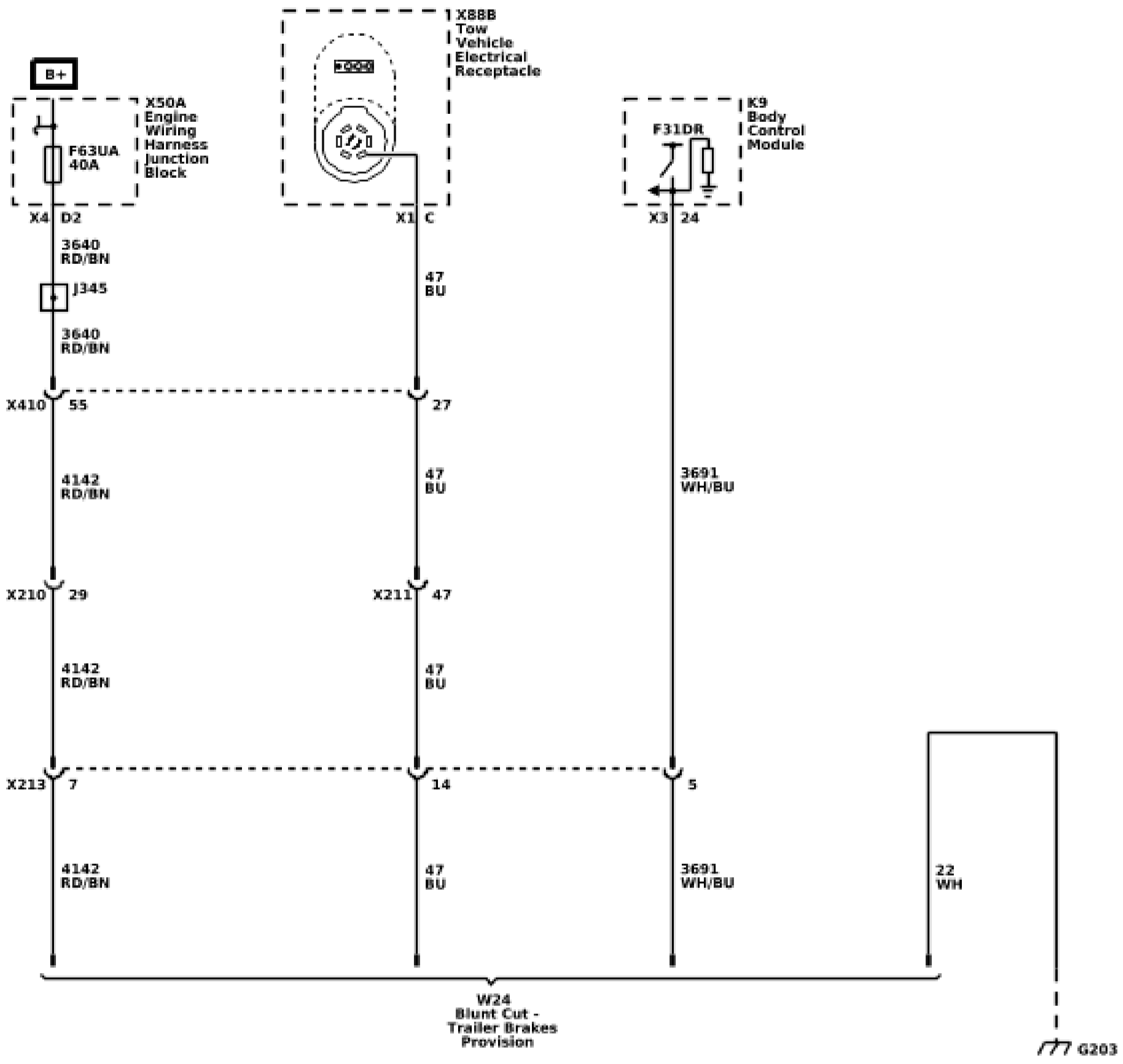

6846407
K219 Lighting Control Module
F31UA
F10DR
F7UA
X2 4
13
X5 29
38 BU/BN
319 GN/BN
318 YE/BU
X2 F3
X2 C2
X2 C1
X50A Engine Wiring Harness Junction Block
KR61 Trailer Backup Lamp Relay
KR53 Parking Lamp Relay
KR63R Trailer Stop/Turn Signal Lamp Relay - Right
KR63L Trailer Stop/Turn Signal Lamp Relay - Left
B+
F55UA 10A
F41UA 20A
F84UA 30A
F81UA 10A
F73UA 10A
B2
A3
H6
H3
G3
X4
X1 A4
1624 GY
2109 BN
3940 OG
1619 GN
1618 YE
650 BK
22 WH
X88B Tow Vehicle Electrical Receptacle
A
F
E
D
G
X1 B
G407
G104

Trailering Systems Schematics (Trailer Connector Pin: C (Z82))


K67
Trailer
Brake
Control
Module
B
JL1
47
BU
J349
Z82-(UY2/Z6A)
Z82+UY2/Z6A
-JL1
47
BU
47
BU
47
BU
J352
X480
C
47
BU
47
BU
X410
27
47
BU
J407
47
BU
X211
47
47
BU
X481
C
47
BU
47
BU
X213
14
Z6A
UY2
47
BU
47
BU
47
BU
47
BU
X1
C
C
X88B
Tow
Vehicle
Electrical
Receptacle
X88GB
Tow Vehicle
Electrical
Receptacle -
5th Wheel/
Camper
W1
Blunt Cut -
Camper/5th
Wheel
Provision
W24
Blunt Cut -
Trailer Brakes
Provision

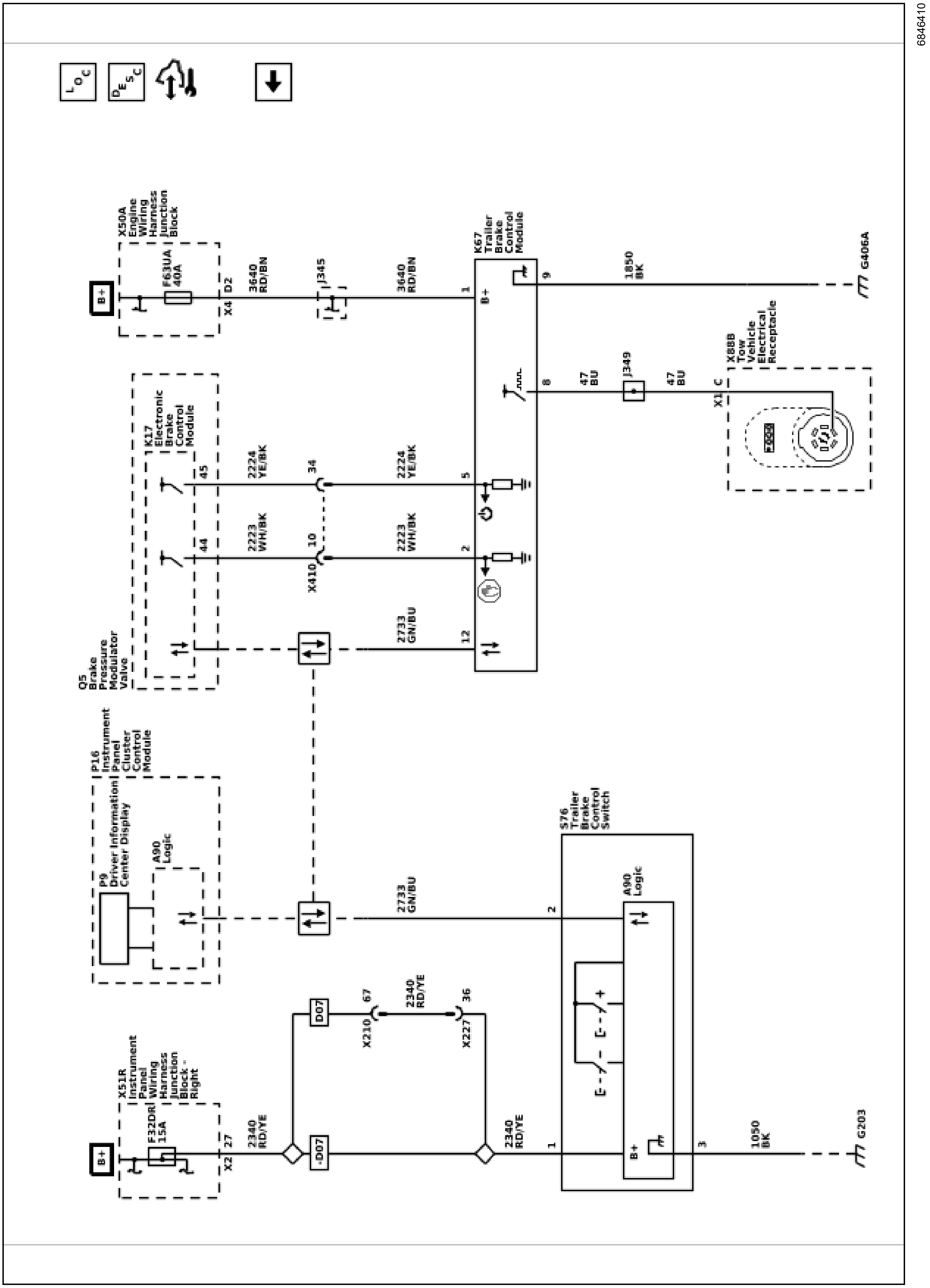
6846408

Trailering Systems Schematics (Trailer Brake Provisions (Z82 - JL1))


B+
X50A
Engine
Wiring
Harness
Junction
Block
F63UA
40A
X4 D2
3640
RD/BN
J345
3640
RD/BN
X410 55
4142
RD/BN
X210 29
4142
RD/BN
X213 7
4142
RD/BN
X88B
Tow
Vehicle
Electrical
Receptacle
X1 C
47
BU
27
47
BU
X211 47
47
BU
14
47
BU
K9
Body
Control
Module
F31DR
X3 24
3691
WH/BU
5
3691
WH/BU
22
WH
G203
W24
Blunt Cut -
Trailer Brakes
Provision

6846409

Trailering Systems Schematics (Trailer Brake (JL1))


6846410
LOC
DESC
B+
X50A Engine Wiring Harness Junction Block
F63UA 40A
X4 D2
3640 RD/BN
J345
3640 RD/BN
1
B+
K67 Trailer Brake Control Module
9
1850 BK
G406A
8
47 BU
J349
47 BU
X1 C
X88B Tow Vehicle Electrical Receptacle
K17 Electronic Brake Control Module
45
2224 YE/BK
34
2224 YE/BK
5
44
2223 WH/BK
10
X410
2223 WH/BK
2
Q5 Brake Pressure Modulator Valve
2733 GN/BU
12
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
2733 GN/BU
2
S76 Trailer Brake Control Switch
A90 Logic
D07
67
X210
2340 RD/YE
36
X227
X51R Instrument Panel Wiring Harness Junction Block - Right
F32DR 15A
X2 27
2340 RD/YE
-D07
2340 RD/YE
1
B+
3
1050 BK
G203

Description and Operation

Trailering Description and Operation

Trailering System Overview

Begin the trailering system diagnosis with [Link target (target-id 325938-) not found] . The Diagnostic System Check - Trailering will provide a complete strategy to locate and repair a vehicle trailering electrical fault. Not following this strategy may cause additional diagnostic time and/or misdiagnosis.

The trailering system consists of the following:

- Trailer Lighting, refer to [Link target (target-id 326023-) not found] for additional diagnostic information.
- {JL1} Trailer Brakes, refer to [Link target (target-id 326020-) not found] for additional diagnostic information.
- Trailer Battery Charging System, refer to [Link target (target-id 326019-) not found] for additional diagnostic information.
- Trailer Detection, refer to [Link target (target-id 326022-) not found] for additional diagnostic information.
- Trailer Tire Pressure Monitoring System, refer to [Link target (target-id 326024-) not found] for additional diagnostic information.
- Trailer Theft Detection.

7–Terminal Tow Vehicle Electrical Receptacle Pinout

- Terminal A – Trailer Backup Lamp Control
- Terminal B – Ground
- Terminal C – Trailer Brake Control
- Terminal D – Right Trailer Stop/Turn Signal Lamp Control
- Terminal E – B+
- Terminal F – Trailer Park Lamp Control
- Terminal G – Left Trailer Stop/Turn Signal Lamp Control

Connecting Aftermarket Accessories

- Some aftermarket accessories that connect to the X88B Tow Vehicle Electrical Receptacle will be recognized by the vehicle as a trailer connected, even if the accessory is not a trailer. As a result, side blind zone detection, rear park assist, and/or rear cross traffic alert will be turned off anytime the vehicle detects a trailer/accessory is connected.
- Vehicles equipped with U1D/UET have trailer theft detection that constantly monitors trailer connected status when enabled. This is done by randomly pulsing the lighting circuits of the trailer when the vehicle is parked. As a result, some aftermarket accessories may be turned ON/OFF when connected to the vehicle with theft detection enabled.
- Vehicles equipped with U1D/UET use pulse width modulation voltage (PWM) for trailer lighting functions. Some aftermarket accessories are incompatible with PWM and may not function correctly when connected to the trailer lighting circuits of the vehicle.

Trailer Battery Charging System

Trailer battery charging is accomplished through constant battery voltage from the X50A Engine Wiring Harness Junction Block to the X88B Tow Vehicle Electrical Receptacle. Battery voltage is supplied to terminal E at the X88B Tow Vehicle Electrical Receptacle at all times. If equipped, the trailer battery will constantly be charged by the vehicle's electrical system anytime the trailer is connected. Some trailers require the B+ circuit to the X88B Tow Vehicle Electrical Receptacle for the trailer brakes to function.

Trailer Lighting and Detection With U1D/UET

Note:

- Some trailers utilize a trailer mounted control module to operate some or all of the trailer lights. These trailers may use the B+ circuit from the trailer connector to power the trailer lighting circuits. These trailers may not always be detected by the Trailer Lighting Control Module and may set faults.
- When a trailer is detected on a vehicle equipped with side blind zone detection, rear park assist, and/or rear cross traffic alert, the vehicle will automatically turn these features off. These features are turned off to prevent false detections due to the trailer obstructing the view of the sensors.
- Vehicles equipped with IOR/1FL do not come equipped with the trailering APP however may still be equipped with a K68 trailer Lamp Control Module.

The K68 Trailer Lamp Control Module is responsible for controlling the trailer lighting on vehicles with U1D/UET. The combined trailer stop/turn signal lamps of the trailer must draw at least 55mA of total current to be detected as a trailer or the Trailer Lamp Control Module will not control the lighting circuits. The Trailer Lamp Control Module receives serial data messages from the K9 Body Control Module (BCM) indicating what lamps have been activated on the vehicle. The Trailer Lamp Control Module responds by applying pulse width modulated voltage (PWM) to the appropriate control circuits for the requested lamps illuminating the lamps on the attached trailer. The Trailer Lamp Control Module constantly monitors for trailer connection status, trailer lighting faults, and trailer theft deterrent purposes. This is accomplished through the lighting circuits of the trailer to determine if a trailer is connected. When a trailer is connected, the Trailer Lamp Control Module senses the trailer connection and alerts the driver by requesting a trailer profile setup through the Trailering App, which is displayed on the infotainment screen. If a trailer is disconnected with the ignition ON, the vehicle will display multiple trailer lighting messages until a trailer is reconnected or the message is dismissed by the user. With the key OFF, the Trailer Lamp Control Module will periodically pulse the lighting circuits of the trailer to verify it is still connected. The lights on the trailer may flash at different intervals with the key OFF depending on which type of lights the trailer is built with. If a trailer is disconnected with the key ON, the vehicle will display a trailer disconnected message until a trailer is reconnected or the ignition is cycled.

Trailer Lighting Without U1D/UET

The K219 Lighting Control Module is responsible for controlling the trailer lighting on vehicles without U1D/UET. The lighting control module receives serial data messages from the K9 Body Control Module (BCM) indicating what lamps have been activated on the vehicle. The lighting control module responds by applying voltage to the appropriate relay control circuits for the requested lamps anytime the vehicle lamps are commanded ON. With the relay coil energized, the relay contacts close and allow voltage to flow through the relay illuminating the appropriate lamps on the attached trailer.

Trailering Messages

The Infotainment Display may display one or more of the following messages to the user related to trailering:

Trailering Messages

Trailering Message	Description
Check Trailer Left Turn Signal Lamp	The K68 Trailer Lighting Control Module detects a fault on the left trailer stop/turn lamp control circuit
Check Trailer Right Turn Signal Lamp	The K68 Trailer Lighting Control Module detects a fault on the right trailer stop/turn lamp control circuit
Check Trailer Rear Lamp	The K68 Trailer Lighting Control Module detects a fault on the trailer park lamp control circuit.
Check Trailer Reversing Lamp	The K68 Trailer Lighting Control Module detects a fault on the trailer backup lamp control circuit.
Check Trailer Brake Lamps	The K68 Trailer Lighting Control Module detects a fault on the left and/or right trailer stop/turn lamp control circuits
{JL1} Check Trailer Wiring	The K67 Trailer Brake Power Control Module detects a fault on the trailer brake control circuit or the trailer was disconnected.
Lane Change Alert Off	Reminder to the user that lane change alerts are turned off anytime a trailer is detected.
Rear Cross Traffic Alert Off	Reminder to the user that rear cross traffic alerts are turned off anytime a trailer is detected.
Rear Park Assist Off	Reminder to the user that rear park assist is turned off anytime a trailer is detected.
Remember to turn On Tow/Haul Mode	Reminder to the user to turn ON Tow/Haul Mode when towing.
{JL1} Service Trailer Brake System	The K67 Trailer Brake Power Control Module detects a fault on the trailer brake control circuit.
Service Trailer Tire Monitor System	The K214 Trailer Tire Pressure Indicator Module detects one or more issues with the trailer tire pressure monitoring system.
Trailer Detected	The K68 Trailer Lighting Control Module detects a trailer has been connected to the X88B Tow Vehicle electrical Receptacle.

Trailering Message	Description
{JL1} Trailer Brakes Detected	The K67 Trailer Brake Power Control Module detects a trailer with trailer brakes has been connected to the X88B Tow Vehicle electrical Receptacle.
Trailer Disconnected Check Connection	The K68 Trailer Lighting Control Module detects a trailer has been disconnected from the X88B Tow Vehicle electrical Receptacle.
Trailer Tire Pressure High	The K214 Trailer Tire Pressure Indicator Module detects one or more of the trailer tire pressures is high.
Trailer Tire Pressure Low	The K214 Trailer Tire Pressure Indicator Module detects one or more of the trailer tire pressures is low.
Trailer Tire Sensor Fault	The K214 Trailer Tire Pressure Indicator Module detects one or more of the trailer tire pressure sensors has a fault.
Trailer Tire Temperature High	The K214 Trailer Tire Pressure Indicator Module detects one or more of the trailer tire temperatures is too high.

Trailer Theft Detection (With U1D/UET Only)

Trailer theft monitoring can be turned ON and OFF through the vehicle Trailer App. When enabled, any time the trailer theft deterrent system is armed, the trailer lighting circuits are constantly monitored to determine if a trailer is connected for trailer theft deterrent purposes. With the key OFF, the K68 Trailer Lamp Control Module will randomly pulse the lighting circuits of the trailer to verify it is still connected by monitoring the voltage drop of the circuit. Depending on the configuration of the trailer lights, the trailer lights may randomly flash as part of the trailer theft deterrent function. These flashes correspond to when the K68 Trailer Lamp Control Module pulses the lighting circuits to ensure the trailer is still connected and is considered normal. If the trailer is disconnected while the trailer theft deterrent system is armed, the vehicle will flash the exterior lights and cycle the horn to alert of a trailer theft event. Refer to *Theft Systems Description and Operation 10-61* for more information on the content theft deterrent system.

Trailer Brakes (JL1)

The vehicle is equipped with the following trailer braking components:

- K17 Electronic Brake Control Module
- K67 Trailer Brake Control Module
- S76 Trailer Brake Control Switch
- Trailer Brake Driver Information Center Display

Trailer Brake Circuits

- Circuit 2223 is the trailer brake apply signal circuit. The K17 Electronic Brake Control Module receives vehicle braking force data and/or data from the application of the manual trailer brake slide lever. The Electronic Brake Control Module responds by applying the appropriate amount of pulse width modulated (PWM) voltage based on the amount of trailer brake application desired. The K67 Trailer Brake Power Control Module responds to the signal circuit by applying the appropriate amount of PWM voltage to the trailer auxiliary control circuit 47.
- Circuit 2224 is the trailer brake enable signal circuit. The K17 Electronic Brake Control Module applies voltage to the enable circuit anytime a LIN data communication fault is not present, a trailer is connected, and the vehicle brakes are being applied. The enable circuit must have voltage applied to it before the K67 Trailer Brake Control Module applies the appropriate amount of pulse width modulated (PWM) voltage to the trailer auxiliary control circuit 47.
- Circuit 2733 is the Electronic Brake Control Module LIN bus 2 circuit. The K17 Electronic Brake Control Module, K67 Trailer Brake Power Control Module, and the S76 Trailer Brake Control Switch all communicate through the Electronic Brake Control Module LIN bus 2 circuit. If the LIN bus has a fault on the circuit, trailer braking will be disabled until the fault is repaired.
- Circuit 47 is the trailer auxiliary control circuit. The K67 Trailer Brake Control Module responds to signal circuit 2223 and enable circuit 2224 by applying the appropriate amount of PWM voltage to the trailer auxiliary control circuit. A properly functioning trailer will apply the appropriate amount of braking force to the brakes of the trailer.

The Trailer Brake Control System is compatible with two types of Trailer Brake Systems as listed below:

1. **Electric Brakes** A controlled electrical output signal energizes an electric-magnet/lever arm assembly that directly actuates the brake mechanism. The GDS name for this system is “Electromagnetic Brakes”.
2. **Electric Over Hydraulic Brakes** A controlled electrical output signal energizes a remote, trailer mounted hydraulic pump to build brake pressure in

a closed hydraulic system on the trailer. The hydraulic fluid pressure actuates the brake mechanism. The GDS name for this system is “Electrohydraulic Brakes”.

Trailer Brake Output Versus Trailer Brake Type

- The trailer brake system characterizes the trailer brakes as either Electric Brake or Electric Over Hydraulic Brake automatically. This characterization may be affected by the number, type, and age of the trailer brake magnets, as well as any other devices installed on the trailer brakes (i.e. adapters for Electric Over Hydraulic brake functionality).
- The trailer brake system is fully operational with either characterization.
- Sliding the manual trailer brake apply lever will produce output at zero speed for either characterization.

The user gain allows the driver to adjust the amount of trailer brake output to match the trailer load and road surface. The controller determines the desired trailer brake output and provides a control signal to the K67 Trailer Brake Control Module (TBPM). The K67 Trailer Brake Control Module amplifies the signal and provides the output required to activate the Electric or Electric Over Hydraulic trailer brakes.

The trailer brake control can support up to a maximum of four axles with electric trailer brakes (8 brake magnets).

Connecting a trailer that is not compatible with the trailer brake system may result in reduced or complete loss of trailer braking. There may be an increase in stopping distance or trailer instability which could result in personal injury or damage to the vehicle, trailer or other property. An aftermarket controller may be available for use with incompatible trailer brake systems.

To determine the type of brakes on your trailer and the availability of controllers, check with your trailer manufacturer or dealer. Do not power up an aftermarket controller with the factory brake controller at the same time.

Trailer Brake Control Panel

The S76 Trailer Brake Control Switch contains the trailer gain and manual apply switches. It is located in the vehicle center stack. Refer to the owner’s manual for more information on the location. The control panel and switches allows you to adjust the amount of output, referred to as trailer gain, available to the Electric or Electric Over Hydraulic brakes. It also allows you to manually apply the trailer brakes. The trailer brake control switch is used along with the trailer brake display page on the driver information center to adjust and display power output to the trailer brakes.

Manual Trailer Brake Apply

The manual trailer brake apply lever is located on the S76 Trailer Brake Control Switch and is used to apply the trailer’s Electric or Electric Over Hydraulic brakes independent of the vehicle’s brakes. This lever is used in the trailer gain adjustment procedure to properly adjust the power output to the trailer brakes.

Sliding the lever will apply only the trailer brakes. The power output to the trailer is indicated in the trailer brake display page in the Driver Information Center (DIC). If the vehicle’s service brakes are applied while using the manual trailer brake apply lever, the trailer brake control output power will be the greater of the two.

The trailer and the vehicle’s brake lamps will come on when either the vehicle’s braking or manual trailer brakes are applied.

Trailer Brake Gain Adjustment

Trailer gain should be set for a specific trailering condition and must be adjusted any time vehicle loading, trailer loading or road surface conditions change. It is important to re-adjust trailer gain any time the tow vehicle, trailer loading or road surface conditions change or if you notice trailer wheel lock-up at any time while you are towing.

Setting the trailer gain properly is needed for the best trailer stopping performance. A trailer that is over-gained may result in locked trailer brakes. A trailer that is under-gained may result in not enough trailer braking. Both of these conditions may result in poor stopping and stability of the vehicle and trailer.

Trailer Gain Adjustment Procedure

- Adjust trailer gain in 0.5 step increments up to 10 gain setting by using the gain adjustment +/− buttons on the trailer brake control panel switch. Pressing and holding a gain button will cause the trailer gain to continuously increment or decrement. To turn the output to the trailer off, set the gain to zero.

- Drive the tow vehicle and trailer combination on a level surface representative of the towing condition and free of traffic at approximately 32–40 km/h (20–25 mph) and fully apply the manual trailer brake apply lever mechanism located on the trailer brake control panel switch. Adjusting the trailer gain at slower speeds may result in an incorrect gain setting.
- Adjust the trailer gain to just below the threshold of trailer wheel lock-up . Trailer wheel lock-up may not occur if towing a heavily loaded trailer. In this case, adjust the trailer gain to the highest allowable setting for the towing condition.

Trailer Brake Gain and Output Display
This display menu can be accessed by scrolling through the DIC menu, or any time the trailer gain +/− button is depressed, or the manual trailer brake apply lever is actuated. The trailer output is displayed from 0 to full output and indicates the output power provided to the trailer brakes, relative to the gain setting.

After the electrical connection is made to a trailer equipped with electric brakes or electric over hydraulic brakes, the TRAILER CONNECTED message will be displayed momentarily on the DIC. The Trailer Brake Display Page can be selected on the DIC showing TRAILER GAIN and OUTPUT, after all vehicle related service messages are acknowledged by the driver. Depending on which instrument panel cluster is in the vehicle, the DIC may display dashed lines, a greyed out display, or it may be blank signifying a disconnected trailer or a trailer brake fault condition.

Tow/Haul Mode

Tow/Haul mode is selected through the Ride Control Switch for hauling heavy loads to provide increased performance and vehicle control. Tow/Haul Mode adjusts the transmission shift pattern, steering, and Electronic Stability Contol (ESC) performance.

If the vehicle is turned off with Tow/Haul mode active and then restarted within four hours or less Tow/Haul will remain active. Otherwise, the vehicle will start in Normal mode.

If equipped with a diesel engine, exhaust braking is automatically activated when Tow/Haul mode is selected. The system will command down shifts to reduce vehicle speed when the brake is applied. The normal tow/haul shift pattern will return once the vehicle is on a low grade or when the accelerator pedal is pressed.

Trailer Brake Driver Information Center Indicators and Messages

Trailer Brake Detection
The K67 Trailer Brake Control Module constantly monitors the trailer auxiliary control circuit from Terminal C at the X88B Tow Vehicle electrical Receptacle. When a trailer is connected with trailer brakes, the K67 Trailer Brake Control Module senses the connection and alerts the driver with a Trailer Connected message. If the K67 Trailer Brake Control Module senses a fault, or the trailer becomes disconnected, the vehicle will alert the driver with a Check Trailer Wiring message.

The following indicators are used to inform the driver of several different conditions:

Trailer Connected
This message will be briefly displayed when a trailer with Electric or Electric Over Hydraulic brakes is first connected to the vehicle. This message will automatically turn off in about ten seconds. The driver can also acknowledge this message before it automatically turns off.

Check Trailer Wiring
This message will be displayed if:

- The system detects that a trailer with Electric or Electric Over Hydraulic brakes is connected to the vehicle and then the trailer harness becomes disconnected from the vehicle.
- The trailer connection is recognized initially and then a disconnect occurs while the vehicle is stationary. This message will automatically turn off in about thirty seconds. This message will also turn off if the driver selects to turn this message off or if the trailer harness is reconnected.
- A disconnect of the trailer wiring harness occurs while the vehicle is moving. The Check Trailer Wiring message will continue until the ignition is turned off. The message will also turn off if the driver selects to turn this message off or it the trailer harness is re-connected.
- There is an electrical fault in the wiring to the electric trailer brakes. The Check Trailer Wiring message will continue as long as there is an electrical fault in the trailer wiring. This message will also turn off if the driver acknowledges this message off.
- A poor connection at the 7–way connector may cause the Check Trailer Wiring message. Some aftermarket 7–way trailer side connector adapters or plugs may cause deformation or excessive wear to the vehicle’s trailer terminals. It is recommended that you use an OEM or Pollak heavy duty 7–way trailer side connector adapter.

Service Trailer Brake System
This message will be displayed when there is a problem with the trailer brake control system. The trailer brake system may not be fully functional, or may not be functioning at all. The trailer brake system is designed to provide trailer braking, if possible, even

when faults prevent it from being fully functional. This reduced functionality includes:

1. Providing trailer braking when the master cylinder pressure or brake pedal switch are faulted.
2. Providing trailer braking when hill start assist and trailer sway control communication is faulted.
3. Providing trailer braking when certain manual trailer brake apply lever faults are present.

Trailer Tire Pressure Monitoring

Special Tools

- *EL-46079/J-46079*
  Tire Pressure Monitor Diagnostic Tool
- *EL-50448*
  Tire Pressure Monitor Sensor Activation Tool
- *EL-52641* Trailer Presence Simulator Tool

For equivalent regional tools, refer to [Link target (target-id 59410-) not found] .

The Trailer Tire Pressure Monitor System is designed to monitor the pressure of the trailer tires, and warn the driver when a low pressure condition exists. Four Trailer Tire Pressure Monitor System sensors may be provided in the vehicle's glove box as an accessory when equipped. The system can accommodate a trailer with up to (6) tires if additional sensors are purchased from the dealership. Also, the system can be paired with up to (5) individual trailers. The sensors must be mounted onto each tire and wheel assembly, and the sensors must be learned by the vehicle by following the learning procedure as shown in the Trailering App section of this manual. For sensor installation assistance, please contact your trailer service center or tire service center. The Trailer Tire Pressure Monitor System sensors monitor the air pressure in the trailer tires and transmit the trailer tire pressure readings to a receiver located in the vehicle. The trailer tire pressure sensors can transmit up to 23 feet (7 meters) from the hitch receiver of the vehicle. The tire pressure values can be viewed in the trailering app in the vehicle's center stack.

Trailering Diagnostic Tools

In some situations when diagnosing trailer tire pressure monitoring, trailer lighting, or integrated trailer brakes, it may be necessary to connect the vehicle to a trailer to confirm proper operation. Performing this activity may prove difficult in the service environment since trailers are not often available for diagnostic use, may have existing electrical issues outside of the issues a technician is attempting to diagnose, or simply may be too unwieldily to connect for diagnosis.

With all this in mind, it may be helpful to build or create a tool that can be plugged into the vehicle's trailer connector and simulate a connected trailer. This tool would include park lamps, stop lamps, and a reverse lamp for lighting and trailer tire pressure monitoring diagnosis. It can be expanded to include trailer brake magnets to diagnose integrated trailer brake concerns. Also, an additional lamp can be included to diagnose the B+ circuit to the trailer.

Trailer issues are NOT covered under warranty, but these tools may be used to verify the vehicle is functioning properly and to help the customer understand and correct any trailer related issues if they so choose.

Available Trailer Presence Simulator Tool

Illustration	Tool Number/Description
5166189	*EL-52641* Trailer Presence Simulator Tool

Simulated Trailer Lighting

Creating a tool to simulate a connected trailer can be used to diagnose issues with trailer lighting, trailer brake (if equipped), the Trailering App (if equipped), and trailer tire pressure monitoring system (if equipped).

If the vehicle is equipped with a K68 Trailer Lamp Control Module (U1D/UET), the module monitors the current on the lighting circuits to determine a trailer has been connected. The Trailer Lamp Control Module pulses current on the trailer lighting circuits every 42 minutes to monitor for a connected trailer. If a current draw greater than 55mA is detected, the Trailer Lamp Control Module recognizes this as a connected trailer. This will enable any trailer lighting controlled by the Trailer Lamp Control Module. The Center Stack Module will also use this trailer detection as a cue to enable the Trailering App and trailer tire pressure monitoring functions.

Creating a Simulated Trailer Lighting Tool

Parts needed:

- 7-way RV trailer connector Qty: 1

Note: The combination trailer stop/turn, and backup lamps must draw at least 55mA of total current to be detected as a trailer. Some LED combination lamps will not draw enough current. If an LED combination lamp is used, make sure it draws at least 55mA. A load resistor can be added to the circuit if necessary to obtain the correct load.

- Combination trailer park/stop/turn lamp (greater than 55mA drawn when on) Qty: 2
- Reverse lamp Qty: 1
- 12 gauge wire and terminals/connectors Qty: As needed
- 18 gauge wire and terminals/connectors Qty: As needed
- Mounting board Qty: 1

1. Connect a 12 gauge wire to the ground terminal of the 7-way trailer connector and the ground circuit of each combination trailer park/stop/turn lamp and the reverse lamp in parallel.
2. Connect an 18 gauge wire between the park lamp terminal of the 7-way trailer connector and the park lamp circuit of each combination trailer park/stop/turn lamp in parallel.
3. Connect an 18 gauge wire between the left turn/stop lamp terminal of the 7-way trailer connector and the turn/stop lamp circuit of left trailer park/stop/turn lamp.
4. Connect an 18 gauge wire between the right turn/stop lamp terminal of the 7-way trailer connector and the turn/stop lamp circuit of right trailer park/stop/turn lamp.
5. Connect an 18 gauge wire between the reverse lamp terminal of the 7-way trailer connector and the reverse lamp.

Note: A combination trailer lighting and trailer brake tool can be created on the same mounting board.

6. Mount the left combination trailer park/stop/turn lamp, right combination trailer park/stop/turn lamp, and reverse lamp to the mounting board.
7. Plug the 7-way RV trailer connector to the vehicle and verify functionality.

Simulated Trailer Brakes

Creating a tool to simulate trailer brakes can be used to diagnose trailer brake issues.

The trailer brake control system is compatible with two types of trailer brake systems: electromagnetic or electro-over hydraulic trailer brakes. The Electronic Brake Control Module must determine which type of brakes the trailer is equipped with so the system can output correctly for the trailer's brake system. Because the Electronic Brake Control Module has to determine the type of trailer brake system that is being used, it can be sensitive to a variety of trailer wiring issues.

The Trailer Brake Control Module continuously sends a test pulse out on the trailer brake control circuit (circuit 47) to determine if a trailer with trailer brakes has been connected. How the pulse reacts when a trailer is connected is how the Trailer Brake Control Module determines which type of braking system the trailer is equipped with.

Even after the system detects the trailer, Trailer Brake Control Module will continue to send this test pulse on the trailer brake control circuit, which now is monitoring both the truck and trailer circuitry. The trailer brake control circuit continues to be monitored for any faults so the driver can be notified of any issues that may occur within the truck or trailer, as well as, to determine when the trailer is disconnected from the truck.

Creating a Simulated Trailer Brake Tool

Parts needed:

- 7-way RV trailer connector Qty: 1
- Electric trailer brake magnets Qty: 2, 4, 6, or 8
- Reverse lamp Qty: 1
- Mounting board Qty: 1
- 12 gauge wire and terminals/connectors Qty: As needed

1. Connect a 12 gauge wire to the ground terminal of the 7-way trailer connector.
2. Connect a 12 gauge wire to the brake controller output terminal of the 7-way trailer connector.

Note: The trailer brake magnets must be connected in parallel. Connecting in series will create an excessive current draw and disable the trailer brake system.

3. Connect the trailer brake magnets to the 12 gauge wires from the 7-way trailer connector in parallel.

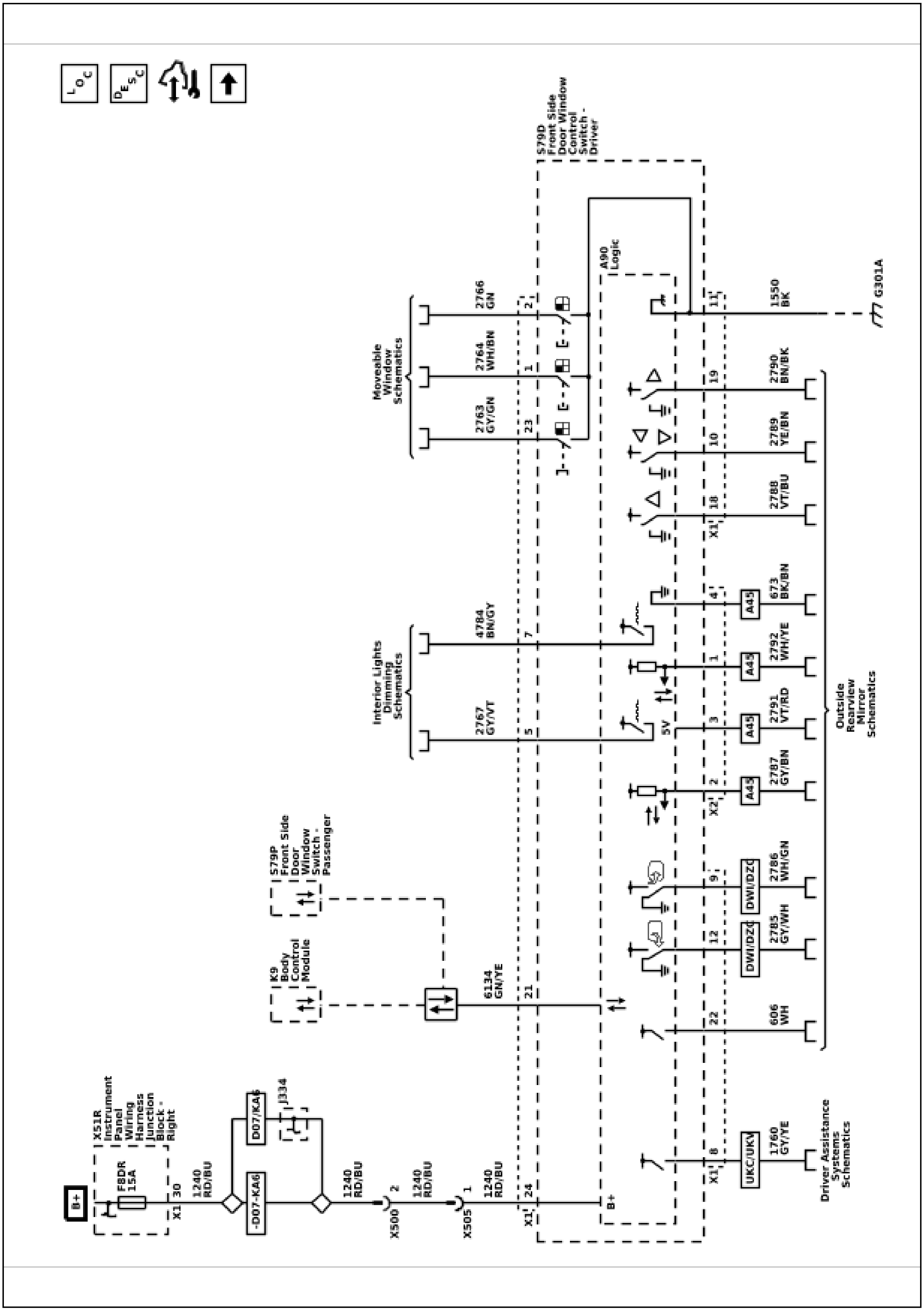
Note: A combination trailer lighting and trailer brake tool can be created on the same mounting board.

4. Mount the trailer brake magnets to the mounting board.
5. Plug the 7-way RV trailer connector to the vehicle and verify functionality.

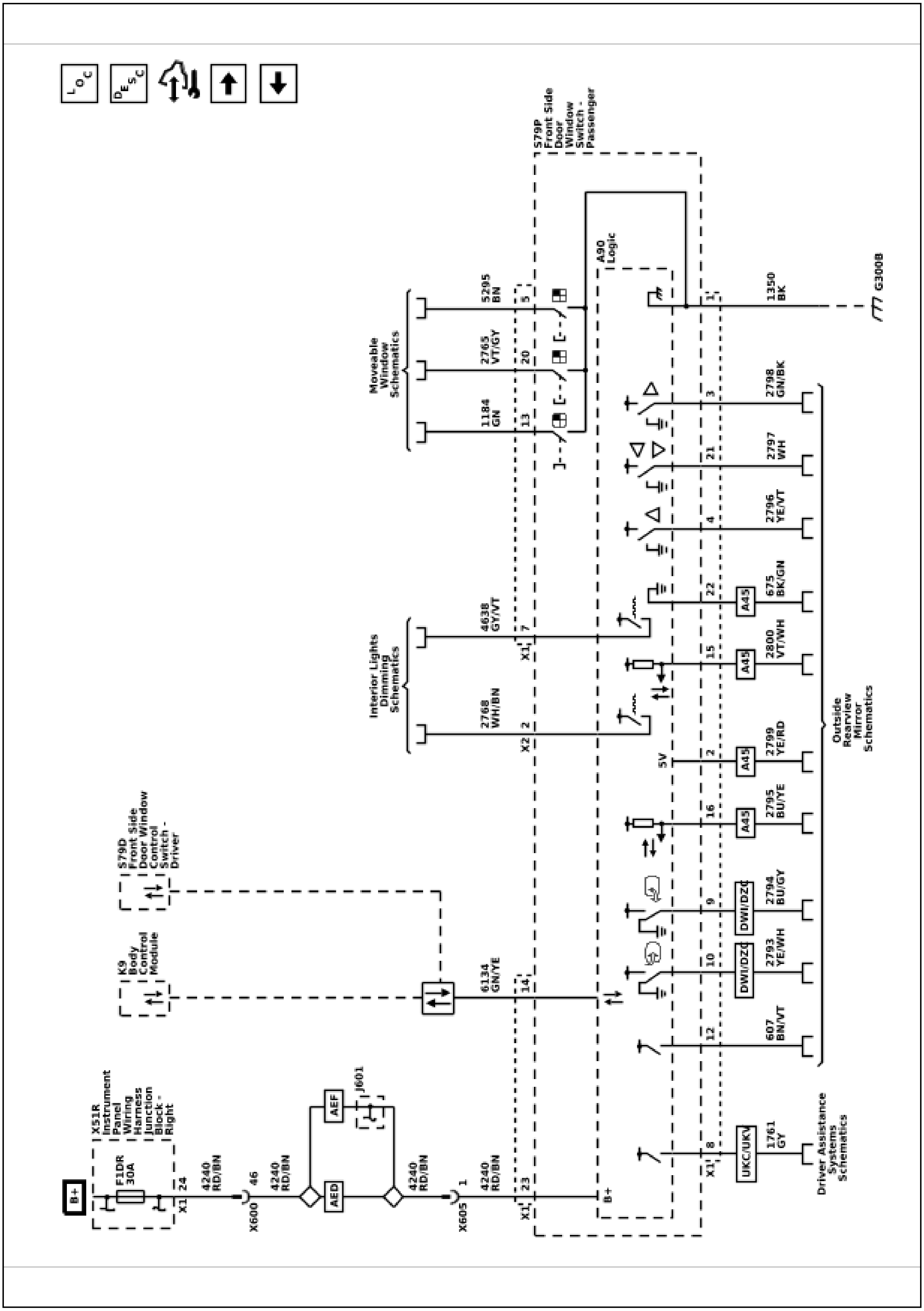
Vehicle Access

Schematic and Routing Diagrams

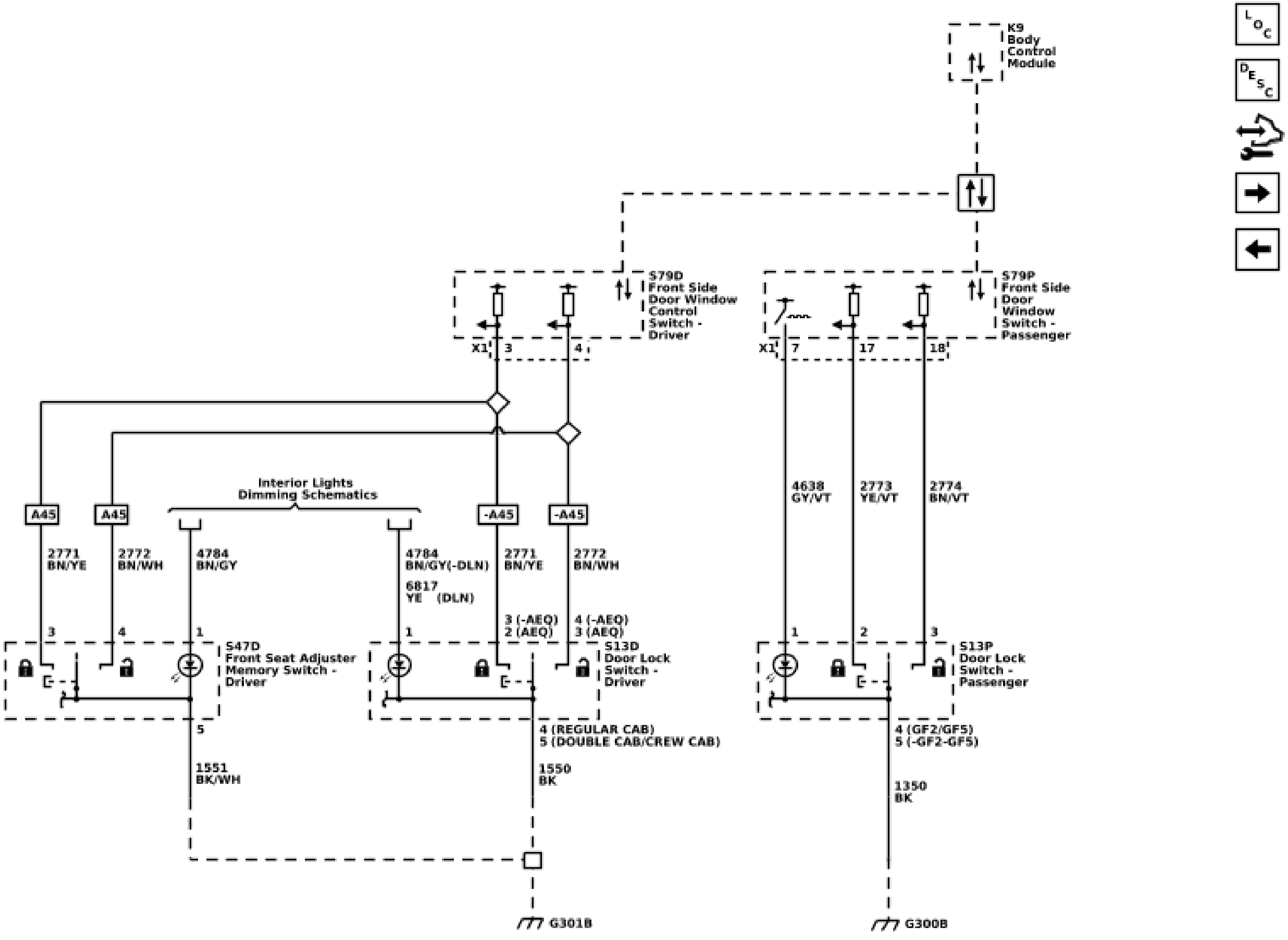
Door Lock/Indicator Schematics (Driver Door Switch Panel Control Module Power, Ground, Serial Data, and Subsystem References)


6846196
LOC
DESC
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F8DR 15A
X1 30
1240 RD/BU
-D07-KA6
D07/KA6
J334
X500 2
X505 1
X1 24
B+
K9 Body Control Module
S79P Front Side Door Window Switch - Passenger
6134 GN/YE
21
22
606 WH
12
2785 GY/WH
DWI/DZC
9
2786 WH/GN
X2 2
2787 GY/BN
A45
3
2791 VT/RD
5V
1
2792 WH/YE
4
673 BK/BN
Interior Lights Dimming Schematics
2767 GY/VT
5
4784 BN/GY
7
X1 18
2788 VT/BU
10
2789 YE/BN
19
2790 BN/BK
Outside Rearview Mirror Schematics
Moveable Window Schematics
2763 GY/GN
23
2764 WH/BN
1
2766 GN
2
11
1550 BK
G301A
A90 Logic
S79D Front Side Door Window Control Switch - Driver
X1 8
UKC/UKV
1760 GY/YE
Driver Assistance Systems Schematics

Door Lock/Indicator Schematics (Passenger Door Switch Panel Control Module Power, Ground, Serial Data, and Subsystem References)

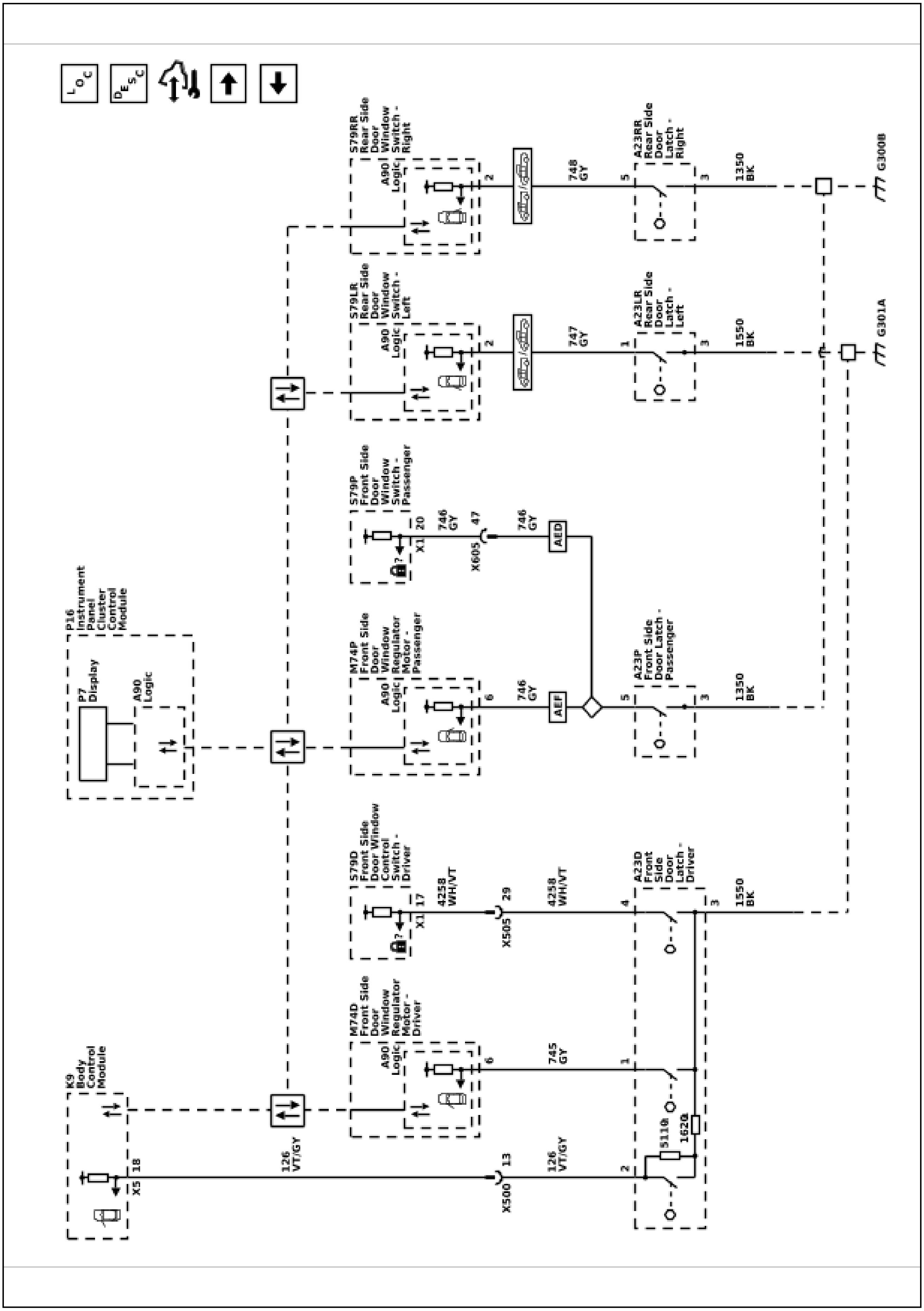

6846197
LOC
DESC
B+
F1DR 30A
X51R Instrument Panel Wiring Harness Junction Block - Right
X1 24
4240 RD/BN
X600 46
AED
AEF
J601
X605 1
X1 23
K9 Body Control Module
S79D Front Side Door Window Control Switch - Driver
6134 GN/YE
14
B+
Interior Lights Dimming Schematics
2768 WH/BN
X2 2
4638 GY/VT
X1 7
Moveable Window Schematics
1184 GN
13
2765 VT/GY
20
5295 BN
5
A90 Logic
S79P Front Side Door Window Switch - Passenger
1
1350 BK
G300B
5V
X1 8
UKC/UKV
1761 GY
Driver Assistance Systems Schematics
12
607 BN/VT
10
DWI/DZC
2793 YE/WH
9
2794 BU/GY
16
A45
2795 BU/YE
2
2799 YE/RD
15
2800 VT/WH
22
675 BK/GN
4
2796 YE/VT
21
2797 WH
3
2798 GN/BK
Outside Rearview Mirror Schematics

Door Lock/Indicator Schematics (Door Lock Switches and Indicators)


K9
Body
Control
Module
S79D
Front Side
Door Window
Control
Switch -
Driver
S79P
Front Side
Door
Window
Switch -
Passenger
X1
3
4
X1
7
17
18
Interior Lights
Dimming Schematics
A45
A45
-A45
-A45
2771
BN/YE
2772
BN/WH
4784
BN/GY
4784
BN/GY(-DLN)
6817
YE (DLN)
2771
BN/YE
2772
BN/WH
4638
GY/VT
2773
YE/VT
2774
BN/VT
3
4
1
1
3 (-AEQ)
2 (AEQ)
4 (-AEQ)
3 (AEQ)
1
2
3
S47D
Front Seat Adjuster
Memory Switch -
Driver
S13D
Door Lock
Switch -
Driver
S13P
Door Lock
Switch -
Passenger
5
4 (REGULAR CAB)
5 (DOUBLE CAB/CREW CAB)
4 (GF2/GF5)
5 (-GF2-GF5)
1551
BK/WH
1550
BK
1350
BK
G301B
G300B
6846198

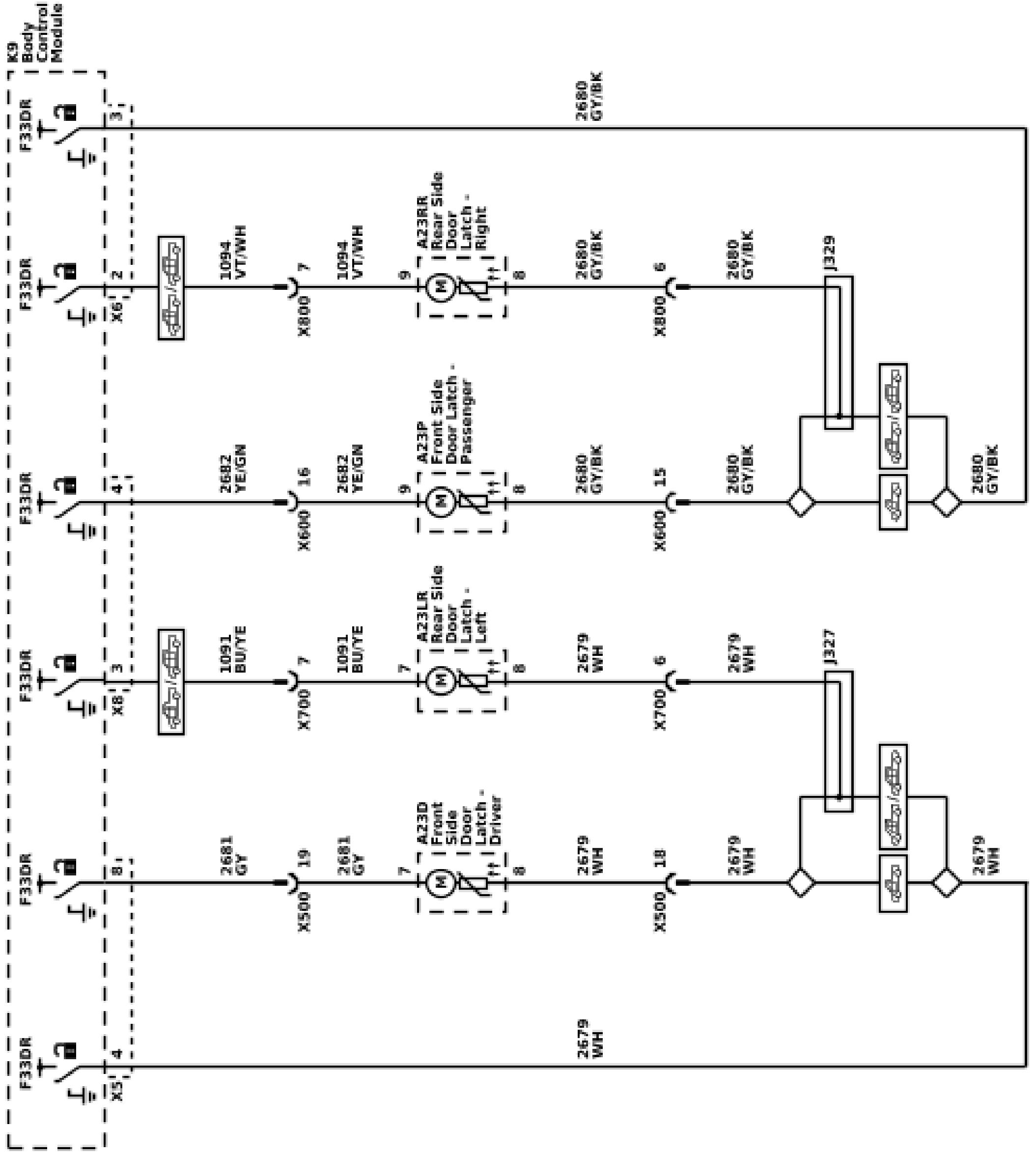
Door Lock/Indicator Schematics (Ajar Switches, Lock Status and Child Lock Status)

6846199

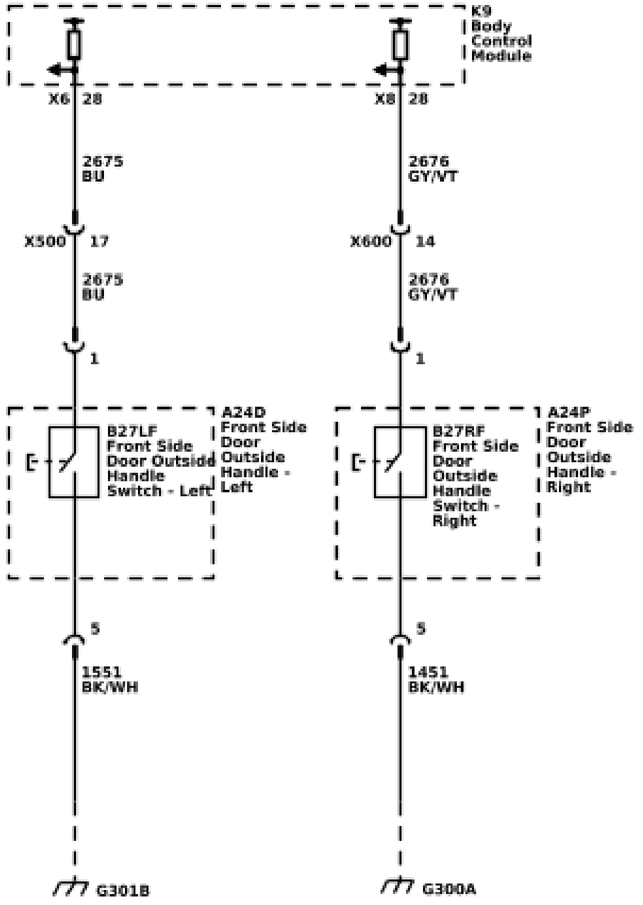

LOC
DESC
K9 Body Control Module
X5 18
126 VT/GY
X500 13
126 VT/GY
M74D Front Side Door Window Regulator Motor - Driver
A90 Logic
6
745 GY
1
S79D Front Side Door Window Control Switch - Driver
X1 17
4258 WH/VT
X505 29
4258 WH/VT
4
A23D Front Side Door Latch - Driver
2
511Ω
162Ω
3
1550 BK
P16 Instrument Panel Cluster Control Module
P7 Display
A90 Logic
M74P Front Side Door Window Regulator Motor - Passenger
A90 Logic
6
746 GY
AEF
5
A23P Front Side Door Latch - Passenger
3
1350 BK
S79P Front Side Door Window Switch - Passenger
X1 20
746 GY
X605 47
746 GY
AED
S79LR Rear Side Door Window Switch - Left
A90 Logic
2
747 GY
1
A23LR Rear Side Door Latch - Left
3
1550 BK
G301A
S79RR Rear Side Door Window Switch - Right
A90 Logic
2
748 GY
5
A23RR Rear Side Door Latch - Right
3
1350 BK
G300B

Door Lock/Indicator Schematics (Actuators)

6846200

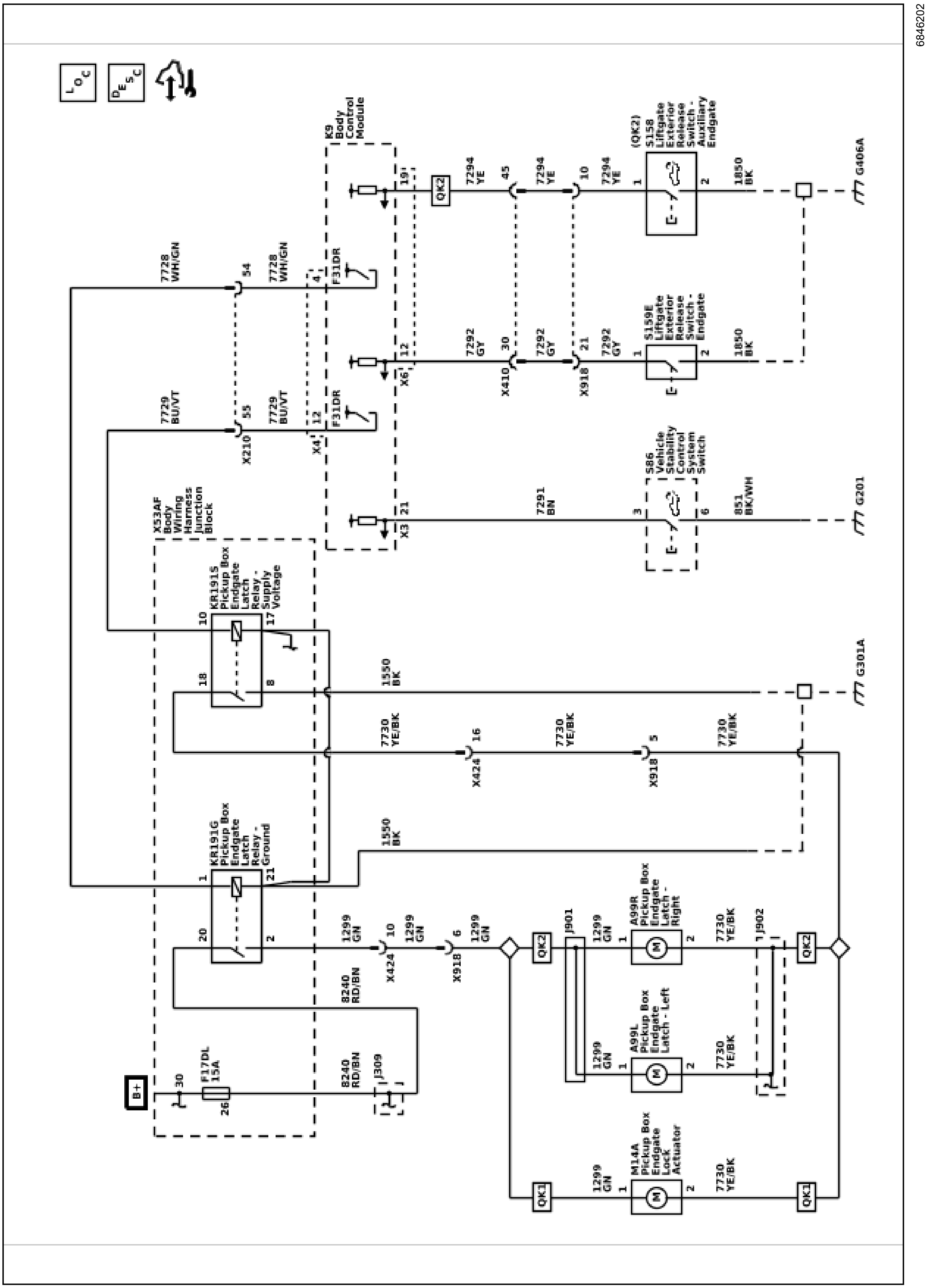

K9 Body Control Module
F33DR
X6
2
3
X8
3
4
8
X5
4
1094 VT/WH
X800
7
9
A23RR Rear Side Door Latch - Right
8
2680 GY/BK
X800
6
J329
2682 YE/GN
X600
16
9
A23P Front Side Door Latch - Passenger
8
X600
15
1091 BU/YE
X700
7
A23LR Rear Side Door Latch - Left
2679 WH
X700
6
J327
2681 GY
X500
19
7
A23D Front Side Door Latch - Driver
X500
18
M

Door Lock/Indicator Schematics (Door Handle Switches)

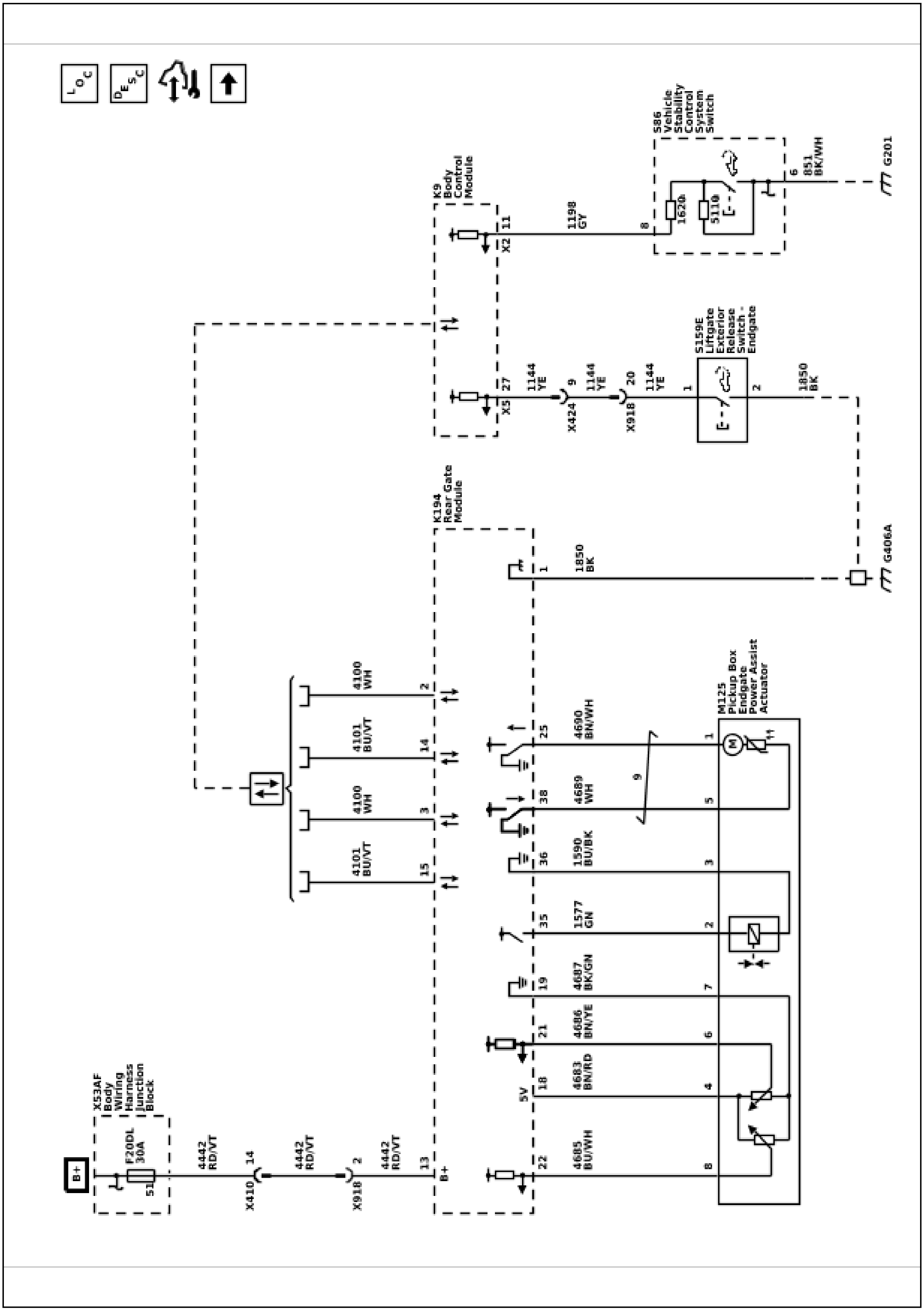

K9
Body
Control
Module
X6 28
2675
BU
X500 17
2675
BU
1
A24D
Front Side
Door
Outside
Handle -
Left
B27LF
Front Side
Door Outside
Handle
Switch - Left
5
1551
BK/WH
G301B
X8 28
2676
GY/VT
X600 14
2676
GY/VT
1
A24P
Front Side
Door
Outside
Handle -
Right
B27RF
Front Side
Door
Outside
Handle
Switch -
Right
5
1451
BK/WH
G300A

6846201

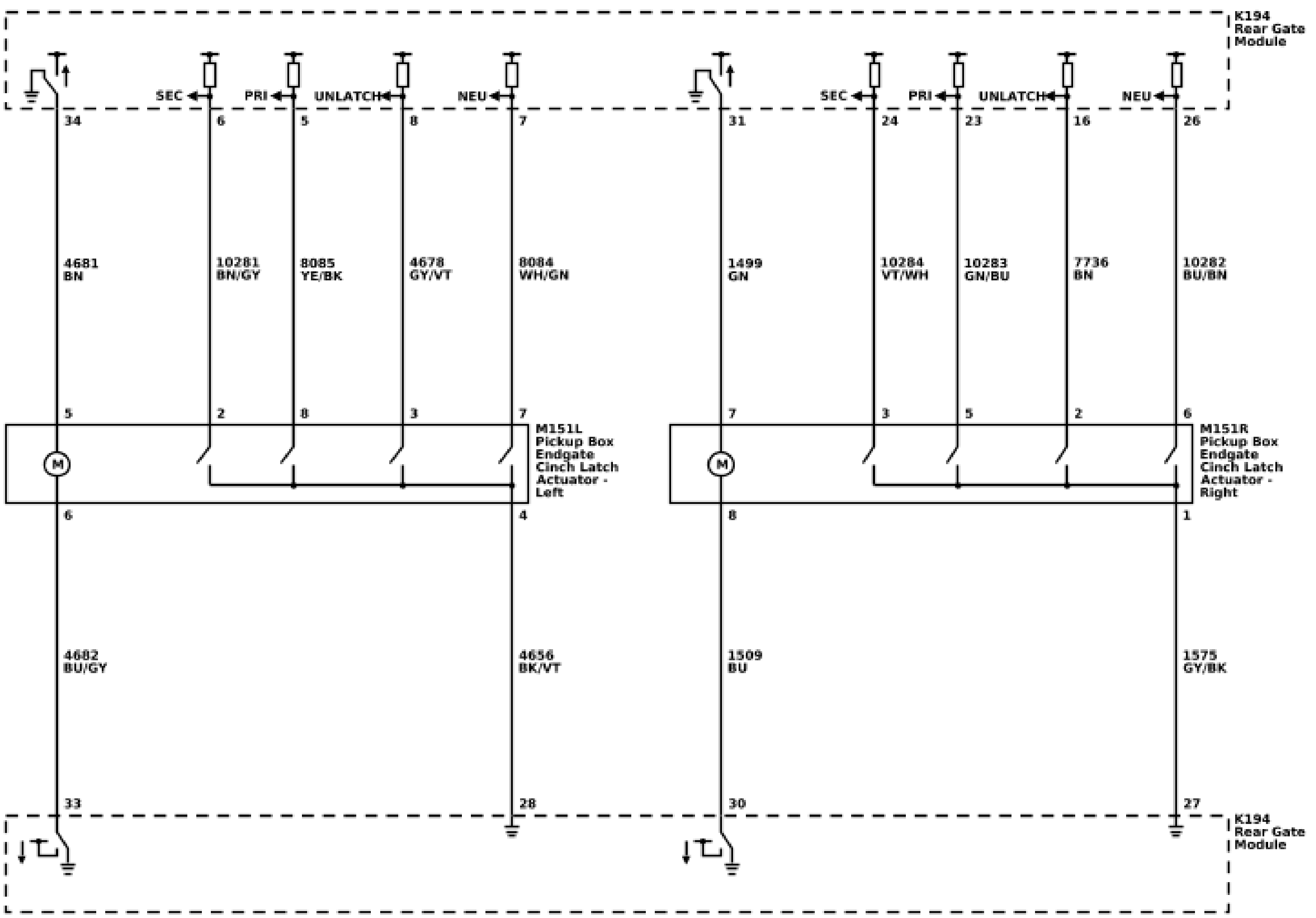
Release Systems Schematics (Endgate Release (QT5))


6846202
LOC
DESC
K9 Body Control Module
X53AF Body Wiring Harness Junction Block
B+
30
F17DL 15A
26
8240 RD/BN
J309
KR191G Pickup Box Endgate Latch Relay - Ground
1
20
21
2
KR191S Pickup Box Endgate Latch Relay - Supply Voltage
10
18
17
8
1550 BK
7730 YE/BK
X424 16
X918 5
1299 GN
X424 10
X918 6
7729 BU/VT
X210 55
X4 12
F31DR
7728 WH/GN
54
4
X3 21
X6 12
19
7291 BN
7292 GY
X410 30
X918 21
7294 YE
QK2
45
10
S86 Vehicle Stability Control System Switch
3
6
851 BK/WH
G201
S159E Liftgate Exterior Release Switch - Endgate
(QK2) S158 Liftgate Exterior Release Switch - Auxiliary Endgate
1
2
1850 BK
G406A
G301A
QK2
J901
A99R Pickup Box Endgate Latch - Right
A99L Pickup Box Endgate Latch - Left
J902
M14A Pickup Box Endgate Lock Actuator
QK1
M

Endgate Schematics (Power Endgate Controls (QT6))

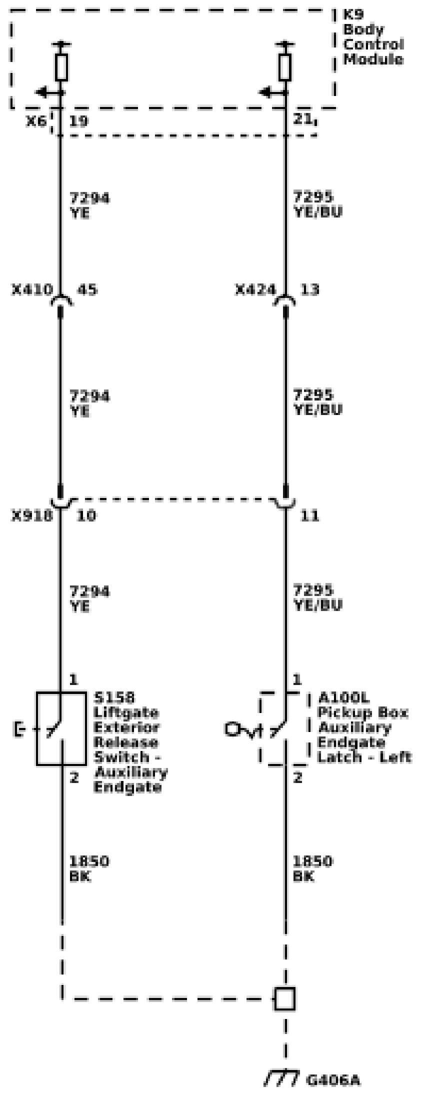

6846203
K9 Body Control Module
X2 11
1198 GY
8
1620Ω
511Ω
S86 Vehicle Stability Control System Switch
6
851 BK/WH
G201
X5 27
1144 YE
X424 9
1144 YE
X918 20
1144 YE
1
S159E Liftgate Exterior Release Switch - Endgate
2
1850 BK
G406A
K194 Rear Gate Module
1
1850 BK
4100 WH
2
4101 BU/VT
14
4100 WH
3
4101 BU/VT
15
25
4690 BN/WH
38
4689 WH
9
36
1590 BU/BK
35
1577 GN
19
4687 BK/GN
21
4686 BN/YE
5V
18
4683 BN/RD
22
4685 BU/WH
13
B+
M125 Pickup Box Endgate Power Assist Actuator
1
5
3
2
7
6
4
8
X53AF Body Wiring Harness Junction Block
B+
F20DL 30A
51
4442 RD/VT
X410 14
4442 RD/VT
X918 2
4442 RD/VT

Endgate Schematics (Power Endgate Latches (QT6))


K194
Rear Gate
Module
SEC
PRI
UNLATCH
NEU
34
6
5
8
7
31
24
23
16
26
4681
BN
10281
BN/GY
8085
YE/BK
4678
GY/VT
8084
WH/GN
1499
GN
10284
VT/WH
10283
GN/BU
7736
BN
10282
BU/BN
5
2
8
3
7
7
3
5
2
6
M151L
Pickup Box
Endgate
Cinch Latch
Actuator -
Left
M151R
Pickup Box
Endgate
Cinch Latch
Actuator -
Right
M
6
4
8
1
4682
BU/GY
4656
BK/VT
1509
BU
1575
GY/BK
33
28
30
27
K194
Rear Gate
Module

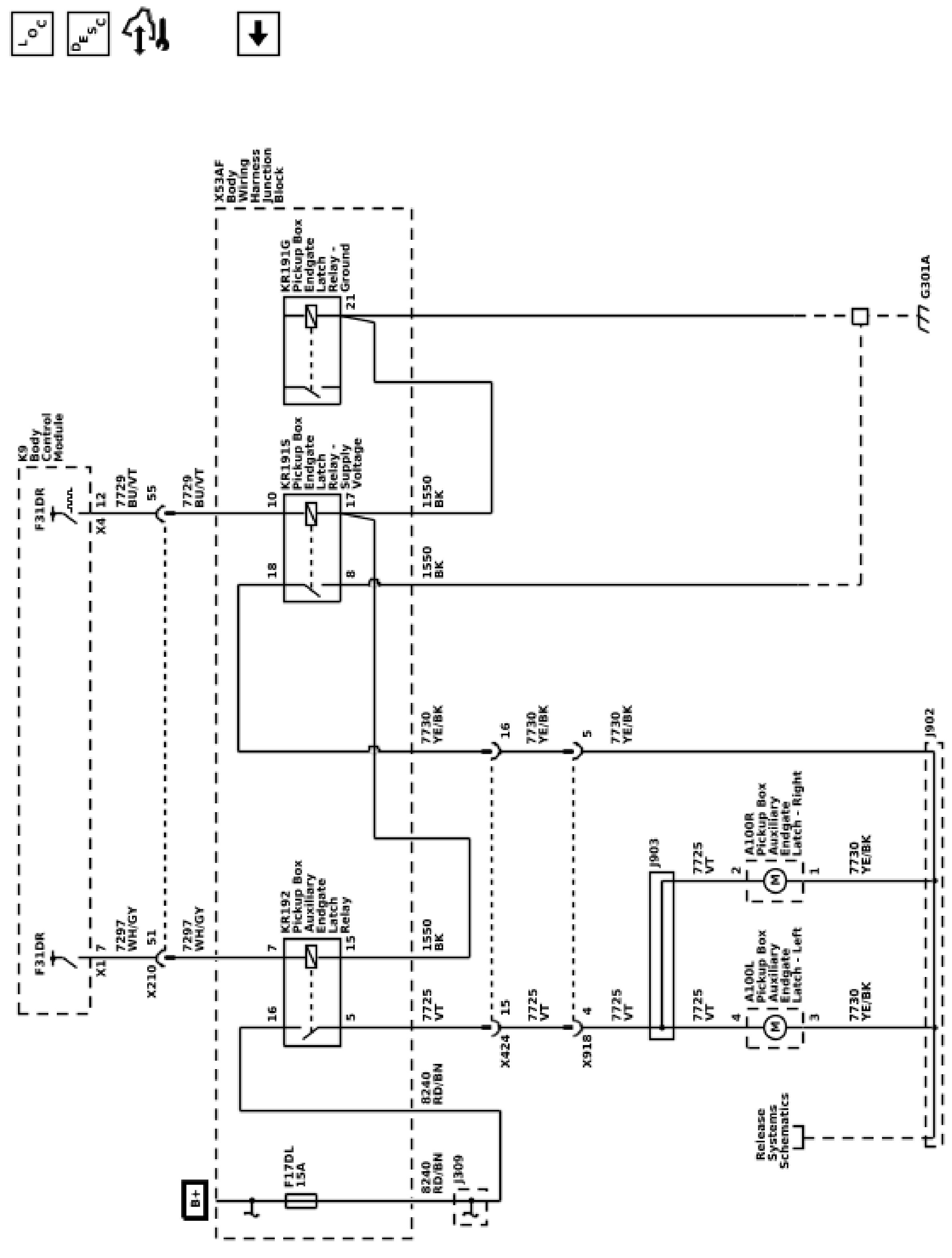
6846204

Endgate Schematics (Auxiliary Endgate Latch Controls and Switches (QK2))

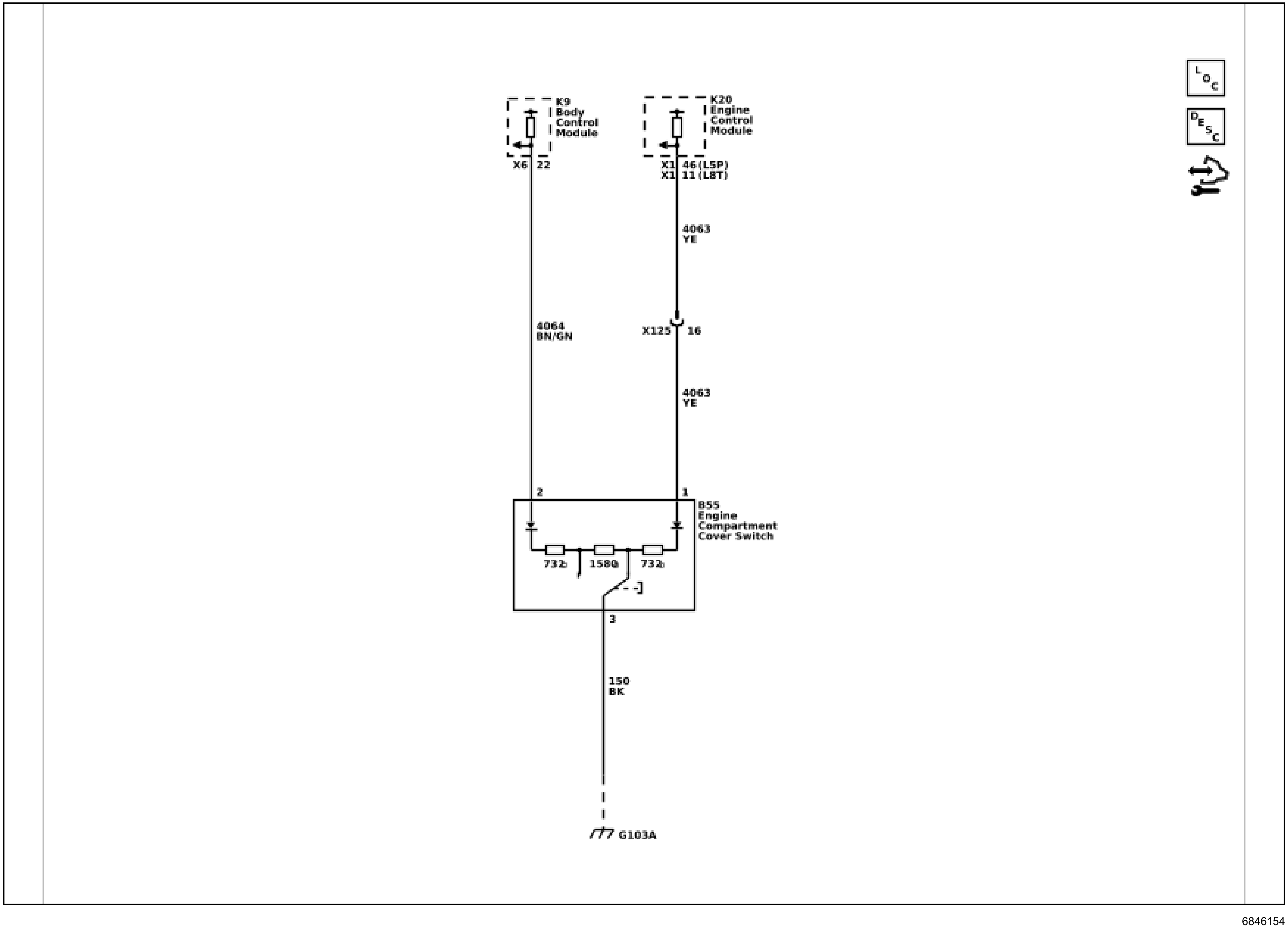

K9
Body
Control
Module
X6
19
21
7294
YE
7295
YE/BU
X410
45
X424
13
7294
YE
7295
YE/BU
X918
10
11
7294
YE
7295
YE/BU
1
S158
Liftgate
Exterior
Release
Switch -
Auxiliary
Endgate
2
1
A100L
Pickup Box
Auxiliary
Endgate
Latch - Left
2
1850
BK
1850
BK
G406A

6846205

Endgate Schematics (Auxiliary Endgate Latch Motors (QK2))


6846206
LOC
DESC
K9 Body Control Module
F31DR
X4 12
7729 BU/VT
55
7729 BU/VT
F31DR
X1 7
7297 WH/GY
51
X210
7297 WH/GY
X53AF Body Wiring Harness Junction Block
KR191G Pickup Box Endgate Latch Relay - Ground
21
G301A
KR191S Pickup Box Endgate Latch Relay - Supply Voltage
10
17
18
8
1550 BK
1550 BK
7730 YE/BK
16
7730 YE/BK
5
7730 YE/BK
J902
KR192 Pickup Box Auxiliary Endgate Latch Relay
7
15
16
5
1550 BK
7725 VT
15
X424
7725 VT
4
X918
7725 VT
J903
7725 VT
2
A100R Pickup Box Auxiliary Endgate Latch - Right
1
7730 YE/BK
7725 VT
4
A100L Pickup Box Auxiliary Endgate Latch - Left
3
7730 YE/BK
M
M
Release Systems Schematics
8240 RD/BN
B+
F17DL 15A
8240 RD/BN
J309

Hood Latch Schematics (Hood Ajar Switch)


K9
Body
Control
Module
X6 22
4064
BN/GN
K20
Engine
Control
Module
X1 46 (L5P)
X1 11 (L8T)
4063
YE
X125 16
4063
YE
2
1
B55
Engine
Compartment
Cover Switch
732Ω
1580Ω
732Ω
3
150
BK
G103A
6846154

Description and Operation

Door Ajar Indicator Description and Operation

Door Ajar Indicator System Components

The door ajar indicator system consists of the following components:

- Body control module (BCM)
- Instrument cluster
- Driver door latch
- Passenger door latch
- Left rear door latch
- Right rear door latch
- Driver window motor
- Passenger window motor
- Left rear side door window switch
- Right rear side door window switch

Driver and Passenger Door Ajar

The window motor supplies a 12V signal to the door ajar switch within the door latch, when a door is open the door ajar switch closes pulling the 12V signal low. When the window motor detects the drop in the 12V signal circuit, it will then communicate this status to the BCM via local interconnect network (LIN) bus. The BCM communicates with the instrument cluster via serial data message. The instrument cluster, upon receipt of this serial data message, will illuminate the door ajar indicator and also send a serial data message to the radio to activate the door ajar audible warning when the vehicle speed is greater then 8 km/h (5 mph).

Rear Doors Ajar

The rear side door window switches each provide a 12V signal to their respective door ajar switch signal circuits. The rear door ajar switches are integral to each rear door latch assembly. When a rear door is opened, the normally open door ajar switch closes. With the door ajar switch closed, ground is provided to the door ajar switch signal circuit and the voltage within the signal circuit drops. The rear side door window switches will detect the voltage drop and will send a serial data message to the body control module which will then send a message to the instrument cluster to command the door ajar message

Endgate Description and Operation (QT6)

System Description

The power endgate system consists of the following components:

- Rear gate module
- Pickup box endgate power assist actuator
- Pickup box endgate position sensor (part of the power assist actuator)
- Interior pickup box endgate control switch (Part of the Instrument panel multifunction switch)
- Exterior pickup box endgate control switch
- Right pickup box endgate latch assembly
- Left pickup box endgate latch assembly
- Keyless entry transmitter
- Remote control door lock receiver

Operation

The power endgate can be commanded to power open by the following methods:

- Pressing the interior pickup box endgate control switch on the center stack
- Pressing the touch pad on the exterior endgate handle (vehicle doors must be unlocked)
- Pressing the endgate button on the RKE transmitter twice and holding until the endgate latches release

The power endgate can be commanded to power close by the following methods:

- Pressing and holding the interior pickup box endgate control switch on the center stack until the endgate is fully closed and latched
- Pressing the touch pad on the exterior endgate handle
- Pressing the endgate button on the RKE transmitter twice and holding until the endgate is fully closed and latched
- Lifting the tailgate at least 10 cm (4 in) above the full close position and holding momentarily

The vehicle must be in Park for any of the power tailgate functions to operate.

The rear gate module will respond to a request by commanding the left and right pickup box endgate latches to release the endgate and activate the pickup box endgate power assist actuator and lower the endgate or to raise and cinch the endgate closed.

Power Latch

The rear gate module continuously monitors power endgate operation and calculates its location and direction of travel from an endgate position sensor (part of the power assist actuator). One input returns the position of the endgate relative to the x-axis and y-axis. The rear gate module then uses these 2 inputs together to calculate its angle relative to the endgate.

The left and right pickup box endgate latches are bi-directional motors and latch or unlatch operation is the result of the direction of the motor rotation. The rear gate module controls the left and right pickup box endgate latches through the control circuits by supplying power and ground in the appropriate polarity. The motor control circuits are monitored by the rear gate module prior to activation for a high or low condition and during motor operation for an insufficient current flow condition. The ratchet, pawl and sector switches are part of the left and right pickup box endgate latches and are used by the rear gate module to determine the state of the latch during the process of latching or unlatching. Each of the latch switch signal circuits are supplied battery voltage and monitored within the rear gate module. The latch switches share a common low reference circuit from the rear gate module and when the switch contacts close the signal circuit goes low and the rear gate module determines the switch to be active. The ratchet, pawl and unlatch switches are inactive when the endgate is closed and will transition to active as the endgate is opened. The sector switch will be inactive when the endgate is closed, during opening of the endgate the sector switch will change to active and back to inactive when the endgate is in the fully open position.

The exterior pickup box endgate control switch signal circuit is supplied battery voltage by the rear gate module. When the switch is pressed the contacts close and the signal circuit goes low, the rear gate module will detect the voltage drop and will command the endgate to release and lower or to power raise the endgate to the closed position.

For vehicles without the optional passive keyless entry, when the exterior pickup box endgate control switch is pressed, the rear gate module will check the status of the vehicle door locks by sending a serial data message to the body control module requesting the door lock status. If the vehicle doors are locked, the rear gate module will ignore the signal from the exterior pickup box endgate control switch. If the vehicle doors are unlocked, the rear gate module will permit the endgate to unlatch and power open when the exterior pickup box endgate control switch is pressed.

For vehicles with the optional passive keyless entry system, the keyless entry control module monitors the proximity of the keyless entry transmitter. If the exterior pickup box endgate control switch is pressed and the keyless entry transmitter is within range, the keyless entry control module will send a serial data message to the rear gate module indicating the presence of the keyless entry transmitter and the rear gate module will permit the endgate to unlatch and power open. If the doors are locked and the keyless entry transmitter is not within range, the rear gate module will ignore the signal from the exterior pickup box endgate control switch.

Manual Endgate Operation

The endgate can be manually closed from the full-open position when the endgate is lifted in a continuous motion. If the endgate motion is stopped between the full-open and half-closed positions, the lift to close feature can engage and power close the endgate. If the touch pad is pressed during power operation, the endgate will stop and allow manual operation. The endgate must be held after stopping, or it will continue to open

Tailgate Release Unavailable Driver Information Center Message

Power Endgate Functions Disabled Without Setting DTCs

The driver information center displays Tailgate Release Unavailable when a thermal inhibit occurs in the latch or drive unit or the position count is out of range.

The power endgate functions will be restored by performing the following actions:

- Closing the endgate which will reset the position counts
- Closing the endgate and removing the F20DL 30A fuse for greater than 5 minutes

Power Endgate Functions Disabled With DTCs Current

The driver information center displays Tailgate Release Unavailable when the rear gate module control module detects a malfunction in the power endgate system and the system is disabled.

Endgate Description and Operation (QT5 Without MultiPro Tailgate)

Endgate Release System Components

- Body control module (BCM)
- Pickup box endgate control switch-interior (Part of the instrument panel multifunction switch)
- Pickup box endgate control switch-exterior
- Pickup box endgate unlatch actuator
- Pickup box endgate unlatch relay

Endgate Release Operation (Without MutiPro Tailgate Option)

Interior Endgate Release Switch
The body control module monitors the voltage level of the endgate unlatch signal circuit so that when the switch is pressed contacts within the switch closes providing a ground path for the endgate unlatch signal circuit, the voltage within the signal circuit is pulled low, the body control module will detect the voltage drop and if the passenger doors are unlocked, will energize the pickup box endgate unlatch relay.

Exterior Endgate Release Switch
The body control module monitors the status of the vehicle doors, if the doors are locked the body control module will ignore the request from the exterior pickup box endgate control switch. If the passenger doors have been commanded to unlock, pressing the exterior pickup box endgate control switch will close contacts within the switch and provide a ground path for the endgate unlatch signal circuit, the body control module will detect the voltage drop and will energize the pickup box endgate unlatch relay.

If the vehicle has been equipped with the passive keyless entry system and the keyless entry transmitter is within 3 feet (1 meter) of the endgate, pressing the exterior pickup box endgate control switch will also function in the same manner but without unlocking the passenger doors. Refer to *Keyless Entry System Description and Operation 10-42* for more information on the passive keyless entry system.

Pickup Box Endgate Unlatch actuator
When body control module receives a endgate release command from the exterior pickup box endgate control switch, the body control module applies brief pulse of voltage to the pickup box endgate unlatch relay control circuit, which energizes the coil side of the relay. The switch side of the pickup box endgate unlatch relay then momentarily closes, supplying a brief pulse of battery positive voltage to the pickup box endgate unlatch actuator. The pickup box endgate unlatch actuator is continuously grounded and when it receives the voltage pulse, it will become energized and the latch will activate releasing the endgate so that it may be manually lowered to an open position.

Endgate Description and Operation (QT5 With MultiPro Tailgate)

Endgate Release System Components

- Body control module (BCM)
- Pickup box endgate control switch-interior (Part of the instrument panel multifunction switch)
- Pickup box endgate control switch-exterior
- Left pickup box endgate latch
- Right pickup box endgate latch
- Left pickup box auxiliary endgate latch
- Right pickup box auxiliary endgate latch
- Left pickup box endgate latch relay
- Right pickup box endgate latch relay
- Left pickup box auxiliary endgate latch relay
- Right pickup box auxiliary endgate latch relay

Endgate Release Operation (With MutiPro Tailgate Option)

Key Fob Liftgate Release Switch
Press twice to open the major endgate. Refer to *Keyless Entry System Description and Operation 10-42* for more information on the passive keyless entry system.

Interior Endgate Release Switch
The body control module monitors the voltage level of the endgate unlatch signal circuit so that when the switch is pressed contacts within the switch closes providing a ground path for the endgate unlatch signal circuit, the voltage within the signal circuit is pulled low. The body control module will detect the voltage drop and if the passenger doors are unlocked, will energize the left pickup box endgate latch relay and right pickup box endgate latch relay which will cause the major endgate to release. When the switch is pressed the body control module will also send a serial data message to the lighting control module to pulse the tail lamps three times.

Exterior Endgate Release Switch
The body control module monitors the status of the vehicle doors, if the passenger doors have been commanded to unlock, pressing the appropriate exterior pickup box endgate control switch will close contacts within the switch and provide a ground path for the major or minor endgate unlatch signal circuit, the body control module will detect the voltage drop and will energize the appropriate pickup box endgate latch relays. When either switch is pressed the body control module will also send a serial data message to the lighting control module to pulse the tail lamps three times. If the vehicle doors are locked an exterior switch press will be ignored.

If the vehicle has been equipped with the passive keyless entry system and the keyless entry transmitter is within 3 feet (1 meter) of the endgate, pressing the exterior pickup box endgate control switch will also function in the same manner but without unlocking the passenger doors. If the vehicle doors are locked the first switch press will just pulse the tail lamps two times, the second switch press will release the gate and pulse the tail lamps three times. Refer to *Keyless Entry System Description and Operation 10-42* for more information on the passive keyless entry system.

Major Pickup Box Endgate

Note: The auxiliary pickup box endgate must be in the latched position before commanding the major pickup box endgate to release. The body control module will disable the major pickup box endgate release function if the auxiliary pickup box endgate is open or ajar.

When body control module receives a major endgate release command from the exterior pickup box endgate control switch, the body control module applies brief pulse of voltage to the left and right pickup box endgate latch relay control circuits, which energizes the coil side of the relays. The switch side of the left and right pickup box endgate latch relay then momentarily closes, supplying a brief pulse of battery positive voltage to the left and right pickup box endgate latches. The left and right pickup box endgate latches will become energized and the latches will activate releasing the major endgate so that it may be manually lowered to an open position.

Minor Pickup Box Endgate

When body control module receives a major endgate release command from the exterior pickup box endgate control switch, the body control module applies brief pulse of voltage to the left and right pickup box auxiliary endgate latch relay control circuits, which energizes the coil side of the relays. The switch side of the left and right pickup box auxiliary endgate latch relay then momentarily closes, supplying a brief pulse of battery positive voltage to the left and right pickup box auxiliary endgate latches. The left and right pickup box auxiliary endgate latches will become energized and the latches will activate releasing the minor endgate so that it may be manually lowered to an open position.

Hood Ajar Indicator Description and Operation

Hood Ajar Switch

Hood Status A

The engine control module (non electric vehicle or hybrid vehicle) or battery energy control module (electric vehicle) applies approximately 5V to the hood status A signal circuit and monitors the voltage to determine the position of the hood. The hood ajar switch contains a multiplexed resistor. When the hood is open, the switch is open and voltage is pulled low. When the hood is closed, the switch is closed and the voltage remains high.

The engine control module or battery energy control module will not allow the vehicle to shift out of park if the hood status is not closed.

Hood Status B

The body control module (BCM) applies approximately 5V to the hood status B signal circuit and monitors the voltage to determine the position of the hood. The hood ajar switch contains a multiplexed resistor. When the hood is open, the switch is open and voltage remains high. When the hood is closed, the switch is closed and the voltage is pulled low.

The BCM uses the hood ajar status as a content theft deterrent alarm trigger.

Hood Ajar Indicator/Message

If either hood status signal shows the hood is ajar or if there is a fault in either hood status signal circuit a message is displayed on the DIC or the hood ajar indicator will be illuminated.

Power Door Locks Description and Operation

Door Lock System Components

The power door lock system consists of the following components:

- Driver door lock switch
- Passenger door lock switch
- Left rear door lock switch
- Right rear door lock switch
- Driver front side door window control switch
- Passenger front side door window switch
- Driver front side door latch
- Passenger front side door latch
- Left rear side door latch
- Right rear side door latch
- Exterior door handle switches
- Body control module
- Lighting control module

Door Lock System Controls

The power door lock system can be controlled by any of the following:

- Power door lock switch activation
- Keyless entry lock or unlock command
- Delayed locking command
- Automatic door lock command
- When the OnStar® system is used to unlock the driver door

Door Lock and Unlock Operation

The driver or passenger front side door window control switch will monitor the voltage of their respective door lock switches, when the driver or passenger door lock switch is activated in the lock or unlock position the signal voltage will be pulled low, the corresponding front side door window control switch will detect the voltage drop in the signal circuit and will send a serial data message to the body control module requesting the door lock or unlock command.

The lighting control module will monitor the voltage of the left rear and right rear door lock switches, when the left rear or right rear door lock switch is activated in the lock or unlock position the signal voltage will be pulled low, the lighting control module will detect the voltage drop in the signal circuit and will send a serial data message to the body control module requesting the door lock or unlock command.

The body control module powers the reversible door latch actuators by providing battery positive voltage and ground to the appropriate lock and unlock control circuits of the door latches. Transitioning of the lock actuators to the lock or unlocked position depends upon which control circuits receive voltage and which control circuits receive ground. When the interior door lock switch is pressed, the body control module disables the functions of exterior door handle unlock switches preventing the unlatching of the vehicle doors until an the interior door unlock switch has been pressed or the appropriate button has been pressed on the keyless entry transmitter.

The body control module provides the driver and left rear door latches and fuel filler door lock actuator (If equipped with RPO N08) with the Unlatch Low Reference Circuit 1.

The body control module provides the passenger and right rear door latches and the liftgate latch (If equipped with RPO TB4) with the Unlatch Low Reference Circuit 2.

Each door latch, the fuel filler door lock actuator (If equipped with RPO N08), and the liftgate latch (If equipped with RPO TB4) is provided an Unlatch Control Circuit by the body control module.

When the drivers door is commanded to unlock the body control module will pull the Unlatch Low Reference Circuit 1 low and will pull the driver door and fuel filler lock actuator Unlatch/Unlock Control Circuits will be pulled high causing the driver door latch and fuel filler lock actuator to transition to the unlocked/unlatched state.

When all doors have been commanded to unlock the body control module will pull the Unlatch Low Reference Circuit 1 and Unlatch Low Reference Circuit 2 low and each door latch and the fuel filler lock actuator Unlatch/Unlock Control Circuits will be pulled high causing the doors and fuel filler lock actuator to transition to the unlocked/unlatched state.

When the TB4 liftgate is commanded to open the body control module, if the vehicle doors are unlocked, will pull the Unlatch Low Reference Circuit 2 low and the Rear Closure Unlatch Actuator Unlatch Control Circuit will be pulled high causing the TB4 liftgate Latch to activate and release the liftgate.

When the lock actuators are inactive the circuits are disconnected from power and ground and the circuits will have a floating voltage.

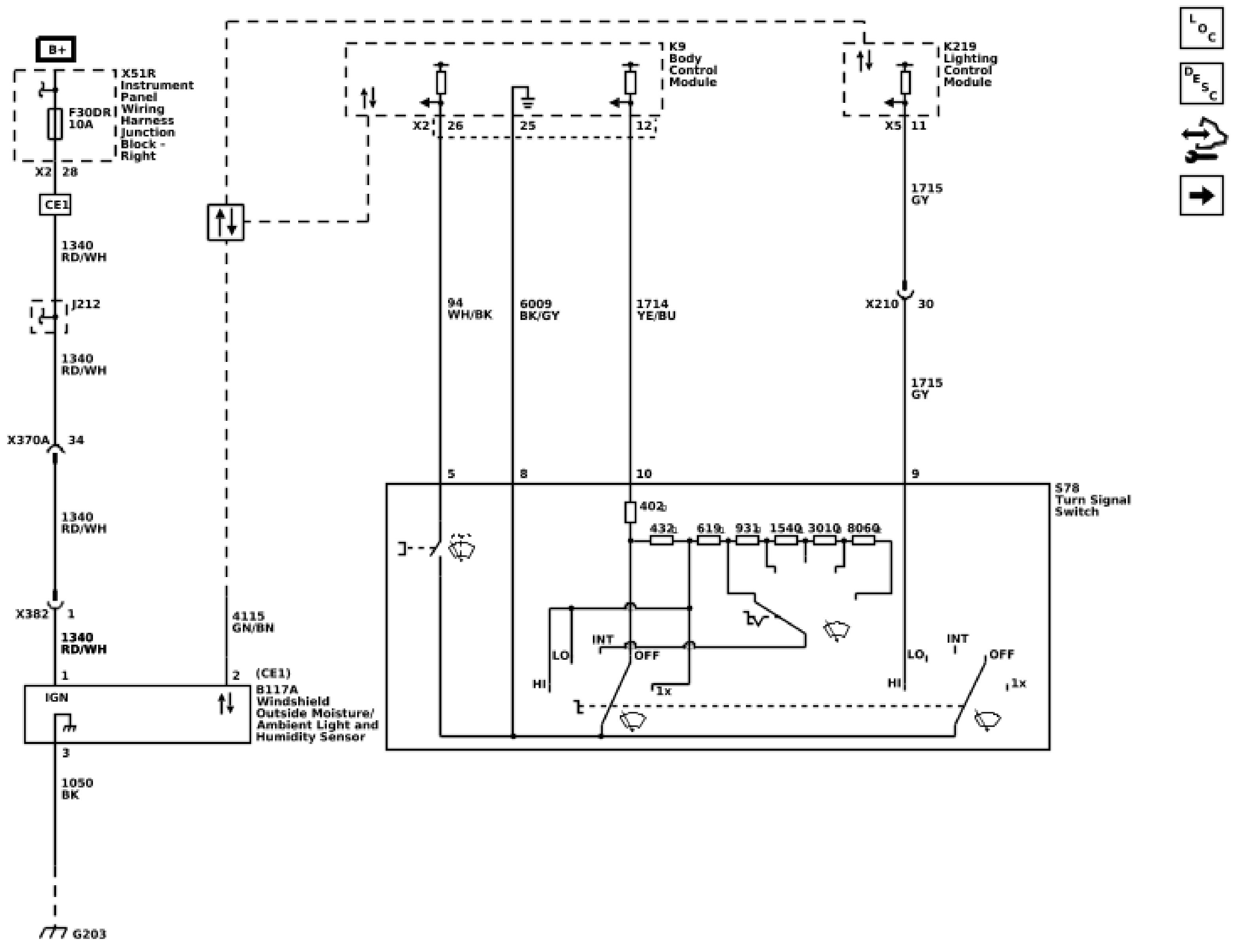
Passive Door Lock/Unlock Operation

The exterior door handle switch signal circuits provide inputs to the body control module when the exterior door handle switches are activated. These inputs allow the body control module to detect a door lock or a door unlock request. The body control module provides a 7 V signal to each exterior door handle switch via the door handle switch signal circuits. When a door handle switch is pressed, the switch closes and the voltage signal within the signal circuit is pulled to ground. The body control module will detect the voltage drop and a low frequency antenna will transmit a challenge to the keyless entry transmitter. If the challenge is met, the keyless entry transmitter will respond, and the body control module will command the door(s) to be locked or unlocked

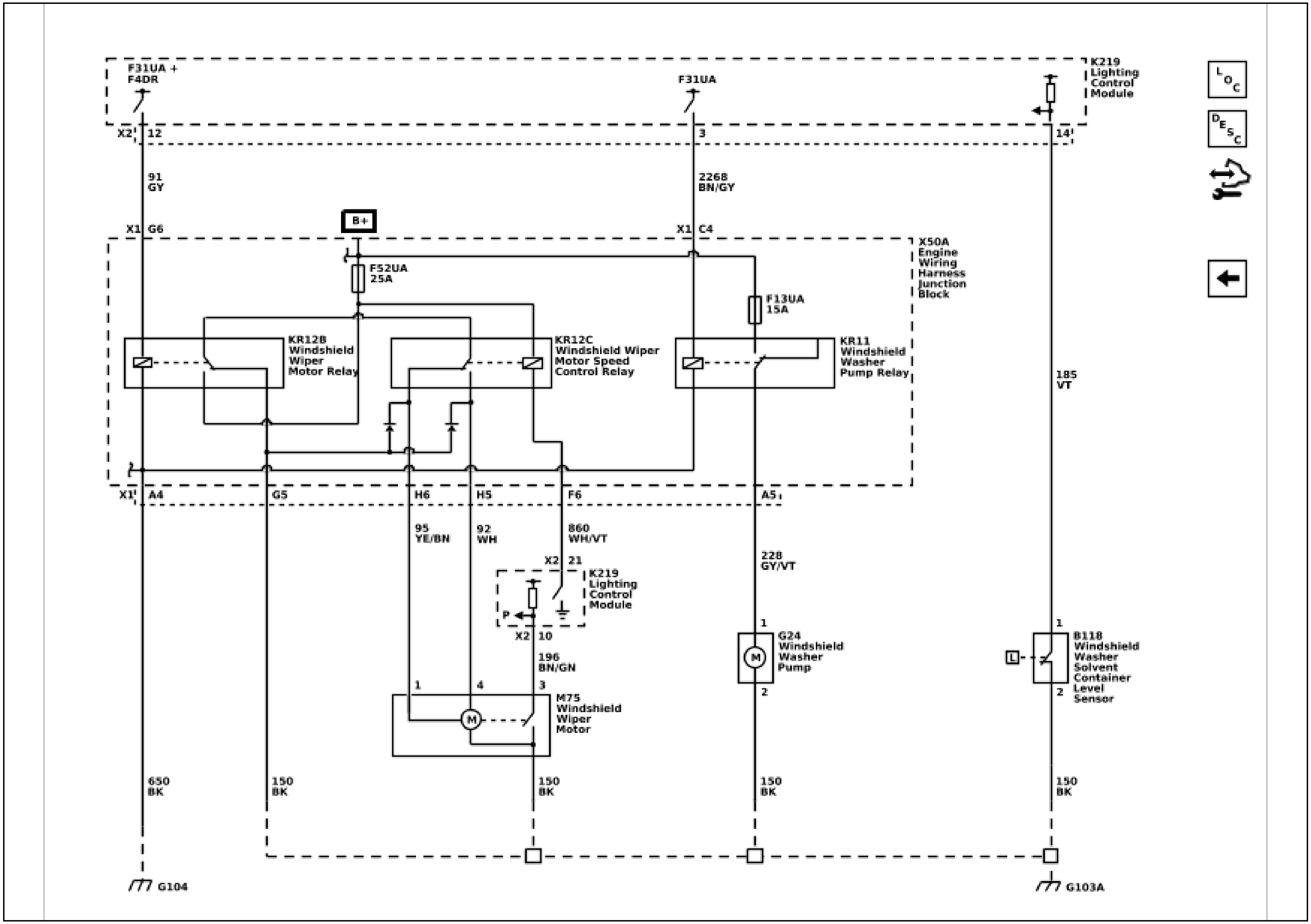
Wipers and Washers

Schematic and Routing Diagrams

Wiper/Washer Schematics (Controls)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F30DR 10A
X2 28
CE1
1340 RD/WH
J212
1340 RD/WH
X370A 34
1340 RD/WH
X382 1
1340 RD/WH
1
IGN
2 (CE1)
B117A Windshield Outside Moisture/ Ambient Light and Humidity Sensor
3
1050 BK
G203
4115 GN/BN
K9 Body Control Module
X2 26
25
12
94 WH/BK
6009 BK/GY
1714 YE/BU
K219 Lighting Control Module
X5 11
1715 GY
X210 30
1715 GY
5
8
10
9
S78 Turn Signal Switch
402Ω
432Ω
619Ω
931Ω
1540Ω
3010Ω
8060Ω
INT
OFF
LO
HI
1x
INT
OFF
LO
HI
1x
6846207

Wiper/Washer Schematics (Wiper Motor and Washer Pump)


F31UA +
F4DR
F31UA
K219
Lighting
Control
Module
X2 12
3
14
91
GY
2268
BN/GY
B+
X1 G6
X1 C4
X50A
Engine
Wiring
Harness
Junction
Block
F52UA
25A
F13UA
15A
KR12B
Windshield
Wiper
Motor Relay
KR12C
Windshield Wiper
Motor Speed
Control Relay
KR11
Windshield
Washer
Pump Relay
185
VT
X1 A4
G5
H6
H5
F6
A5
95
YE/BN
92
WH
860
WH/VT
228
GY/VT
X2 21
K219
Lighting
Control
Module
P
X2 10
196
BN/GN
1
4
3
M75
Windshield
Wiper
Motor
M
1
G24
Windshield
Washer
Pump
2
1
L
B118
Windshield
Washer
Solvent
Container
Level
Sensor
2
650
BK
150
BK
150
BK
150
BK
150
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G104
G103A
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6846208

Description and Operation

Wiper/Washer System Description and Operation

Front Windshield Wiper Operation

The windshield wipers system allows the driver to clear the vehicle's windshield using a discrete switch or through an automatic rain sensing system. The windshield wiper system functions through a primary control, but also allows redundant high speed-only operation in the event of a system fault. The wiper systems uses the S78 Turn Signal Switch as the primary means of driver control, along with the B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor to modulate intermittent wiper operation. The S78 Turn Signal Switch is a discrete input to the K9 Body Control Module. The K9 Body Control Module communicates with the K219 Lighting Control Module over CAN, and with the B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor over LIN, to control wiper activation.

Low Speed Wiper Operation
With the S78 Turn Signal Switch in the low speed position, the discrete signal circuit to the K9 Body Control Module is pulled down through two resistors in a resistor ladder to a low reference provided by the K9 Body Control Module. The K9 Body Control Module communicates with the K219 Lighting Control Module over CAN, requesting consistent low speed wiping operation. To initiate low speed operation, the K219 Lighting Control Module energizes the KR12B Windshield Wiper Relay. This allows battery voltage from the wiper fuse to be applied through the switched contacts of the KR12B Windshield Wiper Relay, through the normally closed contacts of the KR12C Windshield Wiper Speed Control Relay, to the windshield wiper low speed control circuit of the M75 Windshield Wiper Motor.

Intermittent Wiper Operation
With the S78 Turn Signal Switch in the intermittent position, the discrete signal circuit to the K9 Body Control Module is pulled down through a number of resistors within a resistor ladder to a low reference provided by the K9 Body Control Module. The number of resistors the signal travels through is dependent on the intermittent selection made on the S78 Turn Signal Switch. The K9 Body Control Module interprets this range of voltage pull-down as a request for intermittent wiper activation, with each pull-down voltage value equating an intermittent delay (sensitivity) level. If the rain sense is enabled the K9 Body Control Module communicates with the B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor via LIN. The B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor utilizes windshield optics to determine the amount of water on the windshield and will communicate this info to the K9 Body Control Module, which will vary wiping cadence based on the intermittent sensitivity selection on the S78 Turn Signal Switch and the amount of water on the windshield. If the rain sense is disabled the K9 Body Control will vary the wiping cadence based on a preset amount of time determined by the intermittent delay selection on the S78 Turn Signal Switch. To initiate wiper operation, the K219 Lighting Control Module energizes the KR12B Windshield Wiper Relay. This allows battery voltage from the wiper fuse to be applied through the switched contacts of the KR12B Windshield Wiper Relay, through the normally closed contacts of the KR12C Windshield Wiper Speed Control Relay, to the low speed control circuit of the M75 Windshield Wiper Motor.

High Speed Wiper Operation
With the S78 Turn Signal Switch in the high speed position, the discrete signal circuit to the K9 Body Control Module is pulled down through two resistors in a resistor ladder to a low reference provided by the K9 Body Control Module. The K9 Body Control Module interprets this specific voltage pull-down as a request for wiper activation. In addition to this pull-down signal, a second switch in the S78 Turn Signal Switch is also pulled down to low reference. This signal is a discrete input to the K219 Lighting Control Module. The K219 Lighting Control Module requests wiping operation. To initiate high speed operation, the K219 Lighting Control Module energizes the KR12B Windshield Wiper Relay and grounds the KR12C Windshield Wiper Speed Control Relay. This allows battery voltage from the wiper fuse to be applied through the switched contacts of the KR12B Windshield Wiper Relay, through the switched contacts of the KR12C Windshield Wiper Speed Control Relay, to the windshield wiper motor high speed control circuit of the M75 Windshield Wiper Motor.

Mist (Single Wipe) Operation
The mist (single wipe) position is a momentary switch position that will return the S78 Turn Signal Switch to the off position as soon as the switch is released. With the S78 Turn Signal Switch in the mist (single wipe) position, the discrete signal circuit to the K9 Body Control Module is pulled down through two resistors in a resistor ladder to a low reference provided by the K9 Body Control Module. The K9 Body Control Module interprets this specific voltage pull-down as a request for wiper activation. The K9 Body Control Module communicates with the K219 Lighting Control Module via CAN, requesting consistent low speed wiping operation as long as the S78 Turn Signal Switch is held in the mist (single wipe) position. If the mist (single wipe) position is only briefly selected, the K9 Body Control Module will request only a single wipe.

Wiper Park Operation
With the S78 Turn Signal Switch in the off position, the discrete signal circuit to the K9 Body Control Module is pulled down through one resistor in a resistor ladder to a low reference provided by the K9 Body Control Module. The K9 Body Control Module interprets this specific voltage pull-down as a request to stop wiper activation. The K9 Body Control Module communicates with the K219 Lighting Control Module via CAN, requesting wiper operation stop. At this time, the K219 Lighting Control Module will deactivate the KR12B Windshield Wiper Relay and KR12C Windshield Wiper Speed Control Relay. The relay contacts will switch back to their normally closed position and will apply ground to the wiper motor power inputs through the normally closed contacts of the wiper relays. This deactivates and dynamically brakes the wiper motor in the park position. When the wiper switch is turned to the OFF position while the wiper motor is somewhere in mid-cycle, the K219 Lighting Control Module will continue to operate the motor until the wipers reach the park position. If the ignition is turned OFF while the wipers are in mid-cycle, the wipers will stop immediately, regardless of position. The K219 Lighting Control Module will park the wipers next time the ignition is turned ON.

The windshield wiper system consists of the following electrical components:

- S78 Turn Signal Switch
- K9 Body Control Module
- K219 Lighting Control Module
- KR12B Windshield Wiper Relay
- KR12C Windshield Wiper Speed Control Relay
- B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor
- M75 Windshield Wiper Motor

Front Windshield Wiper Components

S78 Turn Signal Switch

The S78 Turn Signal Switch is the primary input to the K9 Body Control Module for the driver to control windshield wiper operation. The S78 Turn Signal Switch also provides discrete input to the K219 Lighting Control Module and M75 Windshield Wiper Motor during high speed wiper operation.

The S78 Turn Signal Switch contains three individual internal switch. One switch changes between mist (single wipe), off, intermittent, low speed, and high speed selection. The second switch changes with differing intermittent sensitivity selection. The third switch is only active when high speed wiper operation is selected. A resistor ladder is also used to determine switch selection and intermittent sensitivity selection. The high speed switch does not utilize the resistor ladder.

The K9 Body Control Module provides the S78 Turn Signal Switch with ground through a single low reference circuit and monitors the switch position through a single signal circuit. Voltage is applied by the K9 Body Control Module to this signal circuit and voltage drop is monitored to determine switch selection. This voltage drop will vary depending on the number of resistors in the resistor ladder, which changes depending on switch position. In the off position, current flows through a single resistor. In the mist (single wipe), low speed, and high speed position, current flows through two resistors. In the intermittent position, current flows through three or more resistors, depending on the intermittent sensitivity selected.

The S78 Turn Signal Switch provides a discrete switch input to the K219 Lighting Control Module during high speed wiper operation. Voltage is applied by the K219 Lighting Control Module to this signal circuit and voltage drop is monitored to determine switch selection. When high speed operation is selected, the signal circuit is pulled to ground (low reference).

K9 Body Control Module

The K9 Body Control Module will send a CAN message to the K219 Lighting Control Module to request wiper operation. The K9 Body Control Module responds to input requests from the S78 Turn Signal Switch. The K9 Body Control Module provides a constant ground for the S78 Turn Signal Switch and monitors a signal circuit to determine the requested windshield wiper position.

The K9 Body Control Module communicates with the B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor via LIN. Messages are received from the B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor to indicate the amount of water on the windshield.

K219 Lighting Control Module

The K219 Lighting Control Module controls the wiper motor via two PCB relays (KR12B Windshield Wiper Relay and KR12C Windshield Wiper Speed Control Relay). The K219 Lighting Control Module receives a message from K9 Body Control Module over CAN to determine what type of wiper operation is requested.

KR12B Windshield Wiper Relay

The KR12B Windshield Wiper Relay supplies B+ to the M75 Windshield Wiper Motor and is controlled by the K219 Lighting Control Module. The coil side of the relay receives a constant chassis ground and the switch side receives a constant B+. When wiper operation is requested, the K219 Lighting Control Module will provide voltage to the coil side of the relay. This will energize the relay, closing the high current contact, and supply B+ to the M75 Windshield Wiper Motor through the KR12C Windshield Wiper Speed Control Relay, enabling wiper operation.

KR12C Windshield Wiper Speed Control Relay
The KR12C Windshield Wiper Speed Control Relay controls B+ to the M75 Windshield Wiper Motor and is controlled by the K219 Lighting Control Module. The coil side of the relay receives a ground controlled by the K219 Lighting Control Module. The switch side of the relay receives B+ through the KR12B Windshield Wiper Relay. When high speed wiper operation is requested, the K219 Lighting Control Module will provide ground to the coil side of the relay. This will energize the relay, closing the high current contact, and supply the B+ to the M75 Windshield Wiper Motor high speed control, enabling high speed wiper operation.

B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor
Note: Due to the sensitivity of the sensor, the wipers may swipe once upon start up or rapid lighting changes.

The B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor utilizes an internal infrared LED and an optic sensor to determine the amount of water on the windshield. The infrared LED bounces infrared light against the inside of the windshield. The optic sensor measures the amount of light returned after bouncing off the windshield. With a dry windshield, all light bounced off the windshield is returned to the optic sensor. As water accumulates on the windshield, the light input to the optic sensor is diffused and reduced. The amount of light reduction corresponds directly to the amount of water on the windshield. The B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor interprets the amount of light returned and communicates this info to the K9 Body Control Module, which will control intermittent wiper operation based on the sensitivity selection of the S78 Turn Signal Switch and the amount of water on the windshield.

M75 Windshield Wiper Motor
The M75 Windshield Wiper Motor receives a constant chassis ground. B+ is controlled by the KR12B Windshield Wiper Relay and KR12C Windshield Wiper Speed Control Relay being operated by the K219 Lighting Control Module.

The M75 Windshield Wiper Motor includes a DC motor and an internal position switch to indicate the wiper park position. When wiper operation is requested, the DC motor spins. The spinning motor is directed to a wiping motion through the windshield wiper transmission. When wiper operation is no longer required, the M75 Windshield Wiper Motor will continue spinning until the internal position switch indicates it is in the park position.

Windshield Washer Operation

The windshield washer system allows the driver to clean the vehicle’s windshield using a discrete switch. The washer system uses the S78 Turn Signal Switch as the primary means of driver control. The S78 Turn Signal is a discrete input to the K9 Body Control Module. The K9 Body Control Module communicates with the K219 Lighting Control Module over CAN to control G24 Windshield Washer Pump activation. The K9 Body Control Module also communicates with the K219 Lighting Control Module to control B+ to the M75 Windshield Wiper Motor during operation.

The windshield wiper system consists of the following electrical components:

- S78 Turn Signal Switch
- K9 Body Control Module
- K219 Lighting Control Module
- KR12B Windshield Wiper Relay
- KR11 Windshield Washer Pump Relay
- G24 Windshield Washer Pump
- M75 Windshield Wiper Motor
- B118B Windshield Washer Fluid Level Switch

Windshield Washer Components

S78 Turn Signal Switch
The S78 Turn Signal Switch is the primary input to the K9 Body Control Module for the driver to control windshield washer operation.

The K9 Body Control Module provides the S78 Turn Signal Switch with ground through a single low reference circuit and monitors the switch position through a single signal circuit. Voltage is applied by the K9 Body Control Module to this signal circuit and voltage drop is monitored to determine switch selection. The S78 Turn Signal Switch contains an internal switch dedicated to windshield washer operation. When the switch is closed, the signal circuit is pulled to ground, indicating washer operation is requested.

K9 Body Control Module
The K9 Body Control Module responds to input requests from the S78 Turn Signal Switch. The K9 Body Control Module provides a constant ground for the S78 Turn Signal Switch and monitors a signal circuit to determine the requested windshield wiper position.

When washer operation is requested, the K9 Body Control Module will send a CAN message to the K219 Lighting Control Module to enable the G24 Windshield Washer Pump, as well as supply B+ to the M75 Windshield Wiper Motor. The K9 Body Control Module communicates with the M75 Windshield Wiper Motor via LIN. When washers are requested, the K9 Body Control Module will request low speed wiper activation from the M75 Windshield Wiper Motor.

K219 Lighting Control Module
The K219 Lighting Control Module controls B+ to the G24 Windshield Washer Pump. When washer operation is requested from a CAN message from the K9 Body Control Module, the K219 Lighting Control Module will apply voltage via a high side driver to the KR11 Windshield Washer Pump Relay. The K219 Lighting Control Module also controls B+ to the M75 Windshield Wiper Motor. When washer operation is requested, the K219 Lighting Control Module will apply voltage via a high side driver to the KR12B Windshield Wiper Relay.

The K219 Lighting Control Module also monitors the B118B Windshield Washer Fluid Level Switch through a discrete signal circuit.

KR12B Windshield Wiper Relay
The KR12B Windshield Wiper Relay supplies B+ to the M75 Windshield Wiper Motor and is controlled by the K219 Lighting Control Module. The coil side of the relay receives a constant chassis ground and the switch side receives a constant B+. When wiper operation is requested, the K219 Lighting Control Module will provide voltage to the coil side of the relay. This will energize the relay, closing the high current contact, and supply B+ to the M75 Windshield Wiper Motor, enabling wiper operation.

KR11 Windshield Washer Pump Relay
The KR11 Windshield Washer Pump Relay supplies B+ to the G24 Windshield Washer Pump and is controlled by the K219 Lighting Control Module. The coil side of the relay receives a constant chassis ground and the switch side receives a constant B+. When wiper operation is requested, the K219 Lighting Control Module will provide voltage to the coil side of the relay. This will energize the relay, closing the high current contact, and supply B+ to the G24 Windshield Washer Pump, enabling washer pump operation.

G24 Windshield Washer Pump
The G24 Windshield Washer Pump receives a constant chassis ground. B+ is controlled by the KR11 Windshield Washer Pump Relay. With voltage applied, a DC motor spins, connecting and pressurizing washer fluid from the washer fluid reservoir. The pressurized washer fluid is deposited on the windshield through a series of lines and nozzles.

M75 Windshield Wiper Motor
The M75 Windshield Wiper Motor receives a constant chassis ground. B+ is controlled by the KR12B Windshield Wiper Relay and KR12C Windshield Wiper Speed Control Relay being operated by the K219 Lighting Control Module.

The M75 Windshield Wiper Motor includes a DC motor and an internal position switch to indicate the wiper park position. When wiper operation is requested, the DC motor spins. The spinning motor is directed to a wiping motion through the windshield wiper transmission. When wiper operation is no longer required, the M75 Windshield Wiper Motor will continue spinning until the internal position switch indicates it is in the park position.

B118B Windshield Washer Fluid Level Switch
The B118B Windshield Washer Fluid Level Switch receives a constant chassis ground. A signal circuit is monitored by the K219 Lighting Control Module. The K219 Lighting Control Module applies voltage to the signal circuit. When the B118B Windshield Washer Fluid Level Switch is closed, voltage on the signal circuit is pulled to ground, indicating fluid in the washer fluid reservoir.

Section 2

Brakes

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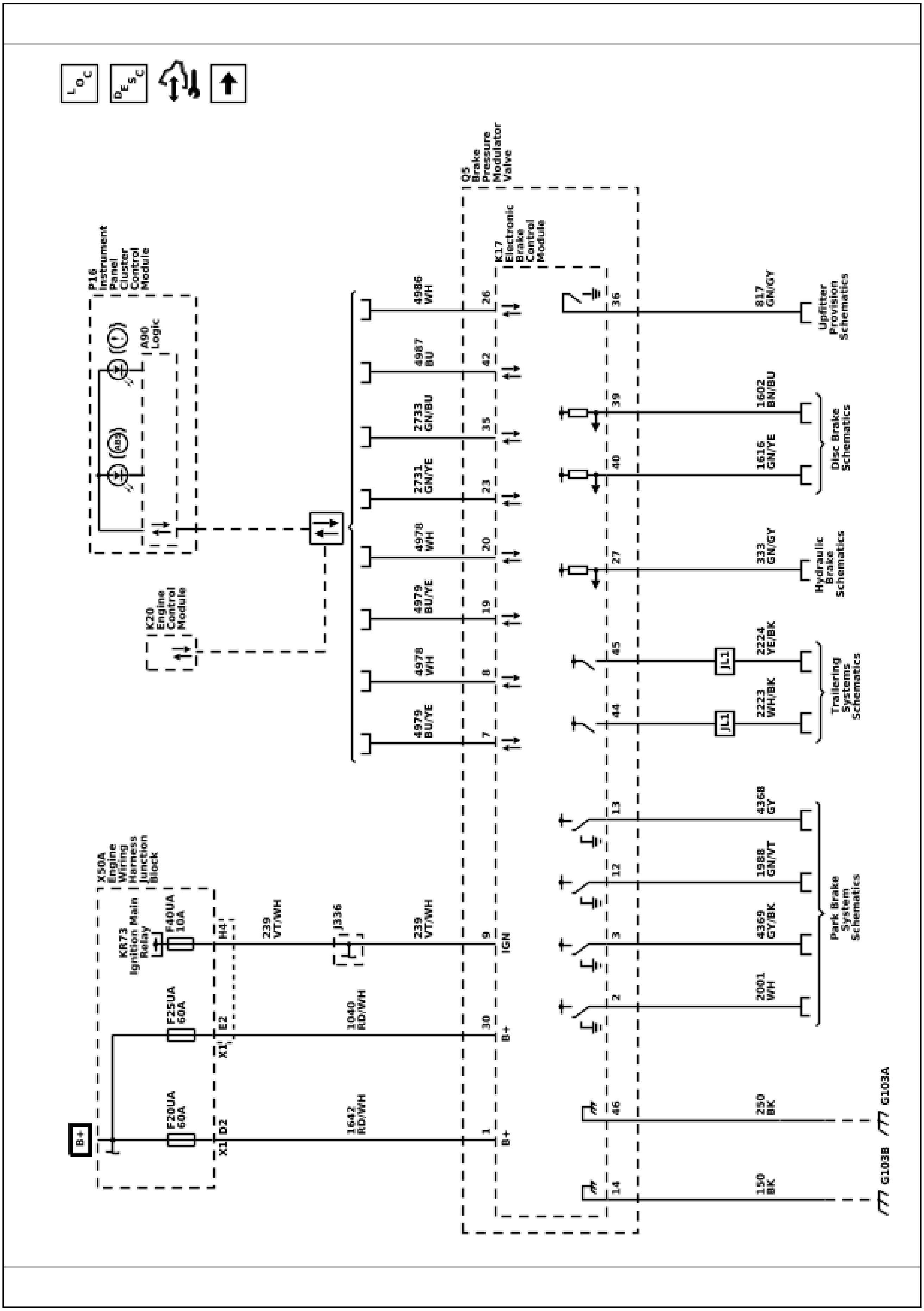
Brakes

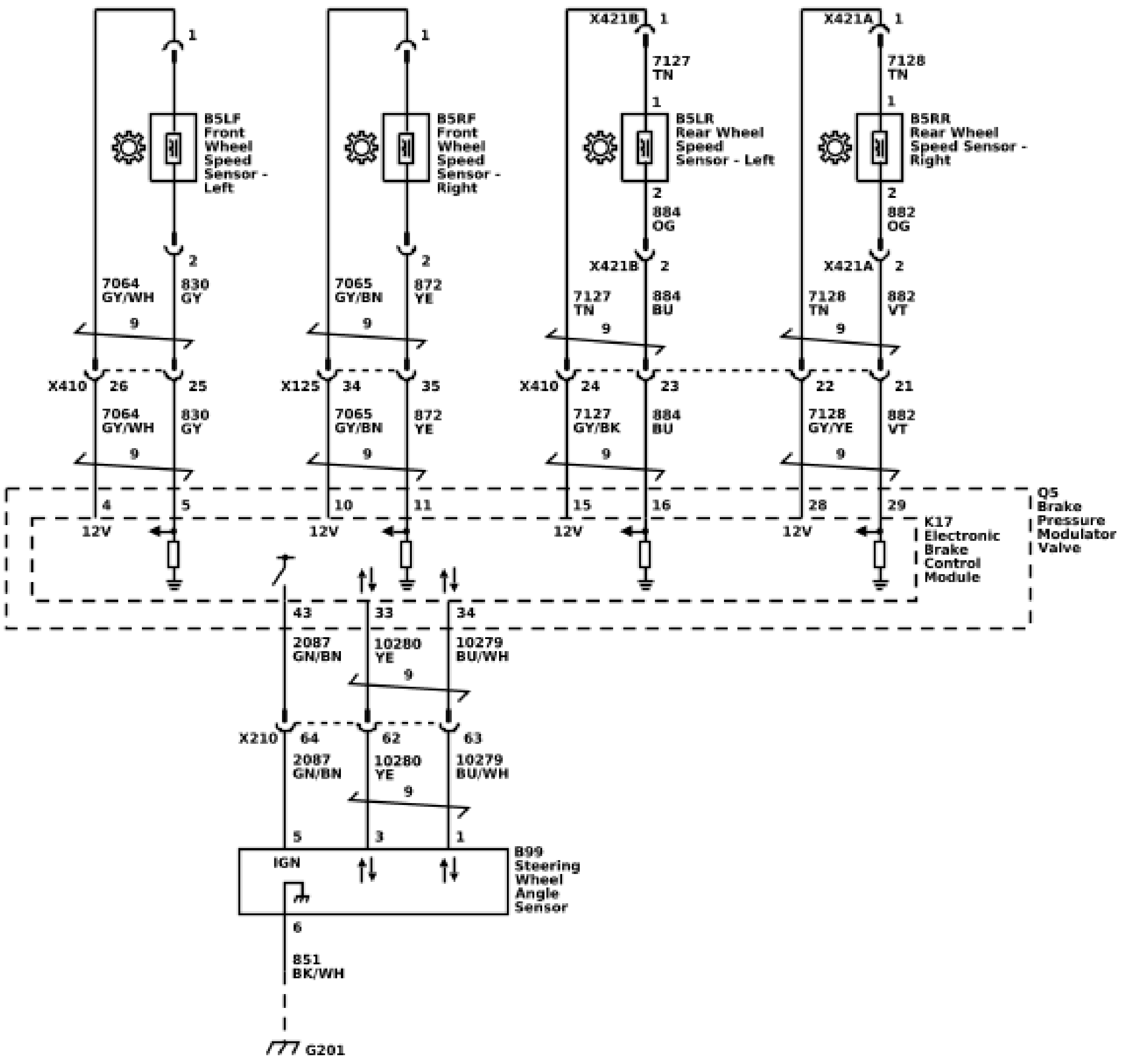
Antilock Brake System

Schematic and Routing Diagrams

Antilock Brake System Schematics (Module Power, Ground, Serial Data, Subsystem References, and Indicators)

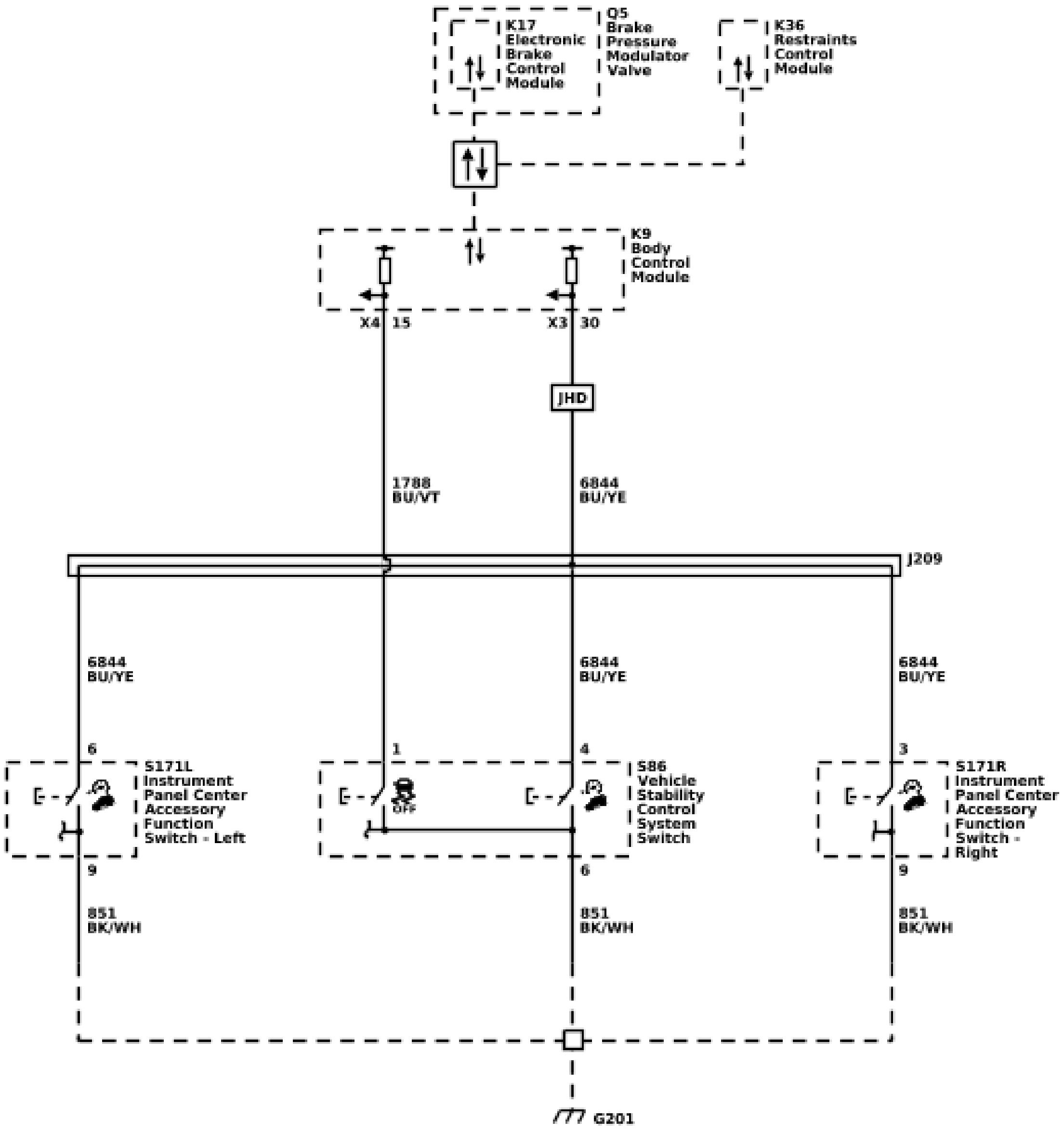

6846209
LOC
DESC
B+
X50A Engine Wiring Harness Junction Block
F20UA 60A
F25UA 60A
KR73 Ignition Main Relay
F40UA 10A
X1 D2
X1 E2
H4
1642 RD/WH
1040 RD/WH
239 VT/WH
J336
239 VT/WH
1 B+
30 B+
9 IGN
P16 Instrument Panel Cluster Control Module
A90 Logic
ABS
K20 Engine Control Module
4979 BU/YE
4978 WH
4979 BU/YE
4978 WH
2731 GN/YE
2733 GN/BU
4987 BU
4986 WH
7
8
19
20
23
35
42
26
Q5 Brake Pressure Modulator Valve
K17 Electronic Brake Control Module
14
46
2
3
12
13
44
45
27
40
39
36
150 BK
250 BK
2001 WH
4369 GY/BK
1988 GN/VT
4368 GY
2223 WH/BK
2224 YE/BK
JL1
JL1
333 GN/GY
1616 GN/YE
1602 BN/BU
817 GN/GY
G103B
G103A
Park Brake System Schematics
Trailering Systems Schematics
Hydraulic Brake Schematics
Disc Brake Schematics
Upfitter Provision Schematics

Antilock Brake System Schematics (Steering Angle and Wheel Speed Signals)


B5LF
Front Wheel Speed Sensor - Left
B5RF
Front Wheel Speed Sensor - Right
B5LR
Rear Wheel Speed Sensor - Left
B5RR
Rear Wheel Speed Sensor - Right
X421B
X421A
1
2
7127 TN
7128 TN
884 OG
882 OG
7064 GY/WH
830 GY
7065 GY/BN
872 YE
884 BU
882 VT
9
X410
26
25
X125
34
35
24
23
22
21
7127 GY/BK
7128 GY/YE
4
5
10
11
15
16
28
29
12V
Q5
Brake Pressure Modulator Valve
K17
Electronic Brake Control Module
43
33
34
2087 GN/BN
10280 YE
10279 BU/WH
X210
64
62
63
5
3
1
IGN
B99
Steering Wheel Angle Sensor
6
851 BK/WH
G201

6846210

Antilock Brake System Schematics (Vehicle Stability and Hill Descent Control)


K17
Electronic
Brake
Control
Module
Q5
Brake
Pressure
Modulator
Valve
K36
Restraints
Control
Module
K9
Body
Control
Module
X4 15
X3 30
JHD
1788
BU/VT
6844
BU/YE
J209
6844
BU/YE
6844
BU/YE
6844
BU/YE
6
1
4
3
S171L
Instrument
Panel Center
Accessory
Function
Switch - Left
OFF
S86
Vehicle
Stability
Control
System
Switch
S171R
Instrument
Panel Center
Accessory
Function
Switch -
Right
9
6
9
851
BK/WH
851
BK/WH
851
BK/WH
G201

6846211

Description and Operation

ABS Description and Operation

The electronic brake control module and the brake pressure modulator are serviced separately. The brake pressure modulator uses a four circuit configuration to control hydraulic pressure to each wheel independently.

Depending on options, the following vehicle performance enhancement systems are provided.

- ABS
- Traction Control
- Stability Control
- Dynamic Rear Proportioning
- Hill Descent Control System
- Hill Hold Start Assist
- Hydraulic Brake Assist
- Intelligent Brake Assist
- Trailer Brake Control System
- Trailer Sway Control

The following components listed below are involved in the operation of the brake system:

- Electronic brake control module - The electronic brake control module controls the system functions and detects failures. It supplies voltage to the solenoid valves and pump motor.
- Brake pressure modulator - The brake pressure modulator contains the following components:
  - Brake pressure sensor
  - Hydraulic pump with pump motor
  - Four isolation vales
  - Four dump valves
  - Two traction/stability control supply valves
  - Two traction/stability control isolation valves
  - High pressure accumulator
  - Low pressure accumulator
- Body control module monitors the brake pedal position sensor signal when the brake pedal is applied and sends a high speed serial data message to the electronic brake control module indicating the brake pedal position.
- Brake pressure sensor is used to sense the action of the driver application of the brake pedal. The sensor provides an analog voltage signal that will increase as the brake pedal is applied. The electronic brake control module monitors the brake pressure sensor which is integral to the brake pressure modulator.
- Instrument cluster - The instrument cluster displays the vehicle speed based on the information from the engine control module. The engine control module sends the vehicle speed information via a high speed serial data to the body control module. The body control module then sends the vehicle speed information via a low speed serial data to the instrument cluster in order to display the vehicle speed, either in kilometers or miles, based on the vehicle requirements.
- Multi-axis acceleration sensor - The yaw rate, lateral acceleration and longitudinal acceleration sensors are combined into one multi-axis acceleration sensor, internal to the inflatable restraint sensing and diagnostic module. The electronic brake control module receives serial data message inputs from the yaw rate, lateral acceleration and longitudinal acceleration sensor and activates stability control and hill hold start assist function depending on multi-axis acceleration sensor input.
- Multifunction switch - The traction control switch is a multifunction momentary switch. The body control module monitors the signal circuit from the traction control switch and sends a high speed serial data message to the electronic brake control module indicating the switch position. The traction control and stability control are manually disabled or enabled by pressing the traction control switch.
- Steering wheel angle sensor - The electronic brake control module receives serial data message inputs from the steering angle sensor. The steering wheel angle sensor signal is used to calculate the intended driving direction.
- Transmission control module - The electronic brake control module receives high speed serial data message inputs from the transmission control module indicating the gear position of the transmission for hill start assist or hill hold functions.
- Active wheel speed sensors - The electronic brake control module supplies a ignition voltage to each wheel speed sensor. As the wheel spins, the wheel speed sensor produces an alternating current square wave signal. The electronic brake control module uses the frequency of the square wave signal to calculate the wheel speed. The electronic brake control module uses the frequency of the square wave signal to calculate the wheel speed. The electronic brake control module sends the wheel speed information via high speed serial data to the engine control module.

Power-Up-Self Test

The electronic brake control module is able to detect many malfunctions whenever the ignition is ON. However, certain failures cannot be detected unless active diagnostic tests are performed on the components. Shorted solenoid coil or motor windings, for example, cannot be detected until the components are commanded ON by the electronic brake control module. Therefore, a power-up self-test is performed to verify correct operation of system components. The electronic brake control module performs the first phase of the power-up self-test when the ignition is first turned ON. This phase consists of internal self-testing of the electronic brake control module along with electrical checks of system sensors and circuits.

Initialization Sequence

The initialization sequence cycles each solenoid valve and the pump motor, as well as the necessary relays, for approximately forty milliseconds to check component operation. One of the checks performed is the adaptive pressure calibration that occurs when the engine is running and the brake pedal is not applied. The adaptive pressure calibration will cycle each of the six isolation valves to verify valve operation. The initialization sequence may be heard and felt while it is taking place, and is considered part of normal system operation. The active test is initiated by the electronic brake control module at the start of the ignition cycle and the speed of the fastest wheel exceeds 16 km/h (10 MPH). If a fault condition is detected the electronic brake control module sets a DTC.

ABS

When wheel slip is detected during a brake application, an ABS event occurs. During ABS braking, hydraulic pressure in the individual wheel circuits is controlled to prevent any wheel from slipping. A separate hydraulic line and specific solenoid valves are provided for each wheel. The ABS can decrease, hold, or increase hydraulic pressure to each wheel. The ABS does not, however, increase hydraulic pressure above the amount which is transmitted by the master cylinder during braking.

During ABS braking, a series of rapid pulsations is felt in the brake pedal. These pulsations are caused by the rapid changes in position of the individual solenoid valves as the electronic brake control module responds to wheel speed sensor inputs and attempts to prevent wheel slip. These pedal pulsations are present only during ABS braking and stop when normal braking is resumed or when the vehicle comes to a stop. A ticking or popping noise may also be heard as the solenoid valves cycle rapidly. During ABS braking on dry pavement, intermittent chirping noises may be heard as the tires approach slipping. These noises and pedal pulsations are considered normal during ABS operation.

Vehicles equipped with ABS may be stopped by applying normal force to the brake pedal. Brake pedal operation during normal braking is no different than that of previous non-ABS systems. Maintaining a constant force on the brake pedal provides the shortest stopping distance while maintaining vehicle stability. The typical ABS activation sequence is as follows.

Pressure Hold

The electronic brake control module closes the isolation valve and keeps the dump valve closed in order to isolate the slipping wheel when wheel slip occurs. This holds the pressure steady on the brake so that the hydraulic pressure does not increase or decrease.

Pressure Decrease

If a pressure hold does not correct the wheel slip condition, a pressure decrease occurs. The electronic brake control module decreases the pressure to individual wheels during deceleration when wheel slip occurs. The isolation valve is closed and the dump valve is opened. The excess fluid is stored in the accumulator until the pump can return the fluid to the master cylinder or fluid reservoir.

Pressure Increase

After the wheel slip is corrected, a pressure increase occurs. The electronic brake control module increases the pressure to individual wheels during deceleration in order to reduce the speed of the wheel. The isolation valve is opened and the dump valve is closed. The increased pressure is delivered from the master cylinder.

Traction Control

When drive wheel slip is noted, the electronic brake control module will enter traction control mode.

First, the electronic brake control module requests the engine control module to reduce the amount of torque to the drive wheels via a serial data message. The engine control module reduces torque to the drive wheels and reports the amount of delivered torque.

If the engine torque reduction does not reduce drive wheel slip, the electronic brake control module will actively apply the brakes on the slipping drive wheel. During traction control braking, hydraulic pressure in each drive wheel circuit is controlled to prevent the drive wheels from slipping. The electronic brake control module commands the pump motor and appropriate solenoid valves ON and OFF to apply brake pressure to the slipping wheel.

Traction control can be manually disabled or enabled by pressing the traction control switch.

Stability Control

Stability control provides added stability during aggressive maneuvers. Yaw rate is the rate of rotation about the vehicle's vertical axis. The stability control is activated when the electronic brake control module determines that the desired yaw rate does not match the actual yaw rate as measured by the yaw rate sensor.

The desired yaw rate is calculated by the electronic brake control module using the following inputs:

- Steering wheel position
- Vehicle speed
- Lateral acceleration

The difference between the desired yaw rate and the actual yaw rate is the yaw rate error, which is a measurement of oversteer or understeer. When a yaw rate error is detected, the electronic brake control module attempts to correct the vehicle's yaw motion by applying brake pressure to one or more of the wheels. The amount of applied brake pressure varies, depending on the correction required. The engine torque may be reduced also, if it is necessary to slow the vehicle while maintaining stability.

Stability control activations generally occur in turns during aggressive driving. When braking during stability control activation, the brake pedal may pulsate.

Stability control can be manually disabled or enabled by pressing and holding the traction control switch for five seconds.

Dynamic Rear Proportioning

The dynamic rear proportioning is a control system that replaces the mechanical proportioning valve. Under certain driving conditions the electronic brake control module will reduce the rear wheel brake pressure by commanding the appropriate solenoid valves ON and OFF.

Hill Descent Control System

The hill descent control system allows a smooth and controlled hill descent in rough terrain without the driver needing to touch the brake pedal. The vehicle will automatically decelerate to a low speed and remain at that speed while activated. Some noise or vibration from the brake system may be apparent when the system is active. The descent control system may be activated, if equipped, by pressing the button on the console. To activate, press the button when traveling at speeds less that 50 km/h (30 MPH). To deactivate, press the button on the console, the brake pedal, or the accelerator. Descent control enables the vehicle to descend using the ABS to control each wheel's speed. If the vehicle accelerates without driver input, the system automatically applies the brakes to slow the vehicle down to the desired speed

Hill Hold Start Assist

The hill hold start assist allows the driver to launch the vehicle without a roll back while moving the foot from the brake pedal to the accelerator pedal. The electronic brake control module calculates the brake pressure, which is needed to hold the vehicle on an incline and locks that pressure for a certain time by commanding the appropriate solenoid valves ON and OFF when the brake pedal is released. Hill hold start assist is activated when the electronic brake control module determines that the driver wishes to move the vehicle up-hill, either backwards or forwards.

The following inputs are used for hill hold start assist feature:

- Accelerator pedal position
- Brake switch
- Brake pressure
- Clutch switch, if equipped
- Engine torque
- Longitudinal acceleration
- Transmission gear information
- Vehicle speed

Hydraulic Brake Assist

The hydraulic brake assist function is designed to support the driver in emergency braking situations.

The electronic brake control module receives inputs from the brake pressure sensor. When the electronic brake control module senses an emergency braking situation, the electronic brake control module will actively increase the brake pressure to a specific maximum.

Intelligent Brake Assist

The intelligent brake assist function is designed to provide limited braking to help prevent front and rear low speed collisions.

The electronic brake control module receives inputs from the brake pedal position sensor, wheel speed sensors, short range radar and ultrasonic sensors to detect a collision. When the electronic brake control module senses a possible collision, it will actively increase the hydraulic brake pressure to apply the brakes.

Trailer Brake Control System

A trailer brake control system is used to control the amount of trailer braking power that is made available to trailers with brakes that require a controlled output electrical signal for actuation. The trailer brake control system determines the trailer brake type (Electric Brake or Electric Over Hydraulic Brake) automatically.

Trailer Sway Control

The trailer sway control will detect any vehicle yaw instability, caused by an attached trailer. When instability is detected, the electronic brake control module attempts to correct the vehicle's yaw motion by applying brake pressure to one or more of the wheels. The engine torque may be reduced also, if it is necessary to slow down the vehicle.

Driver Information Indicators

Brake Warning Indicator

The instrument cluster turns the brake warning indicator ON when the following occurs:

- The instrument cluster performs the bulb check.
- The body control module detects that the parking brake is engaged. The instrument cluster receives a serial data message from the body control module requesting illumination.
- The electronic brake control module detects a faulty pump motor, solenoid valves, an internal hardware failure or a too high or too low battery voltage and sends a serial data message to the instrument cluster requesting illumination.

ABS Indicator

The instrument cluster turns the ABS indicator ON when the following occurs:

- The instrument cluster performs the bulb check.
- The electronic brake control module detects a malfunction which disables the ABS and sends a serial data message to the instrument cluster requesting illumination.

Hill Descent Control Indicator

The instrument cluster turns the hill descent control indicator ON when the following occurs:

- The instrument cluster performs the bulb check.
- The driver manually enables or disables the hill descent control by pressing the hill descent control switch. The electronic brake control module sends a serial data message to the instrument cluster requesting illumination.

Traction Control Off Indicator

The instrument cluster turns the traction control off indicator ON when the following occurs:

- The instrument cluster performs the bulb check.
- The driver manually disables the traction control by pressing the traction control switch. The electronic brake control module sends a serial data message to the instrument cluster requesting illumination.

Stability Control Off Indicator

The instrument cluster turns the stability control off indicator ON when the following occurs:

- The instrument cluster performs the bulb check.
- The driver manually disables the stability control by pressing and holding the traction control switch for five seconds. The electronic brake control module sends a serial data message to the instrument cluster requesting illumination.

Traction/Stability Control Indicator

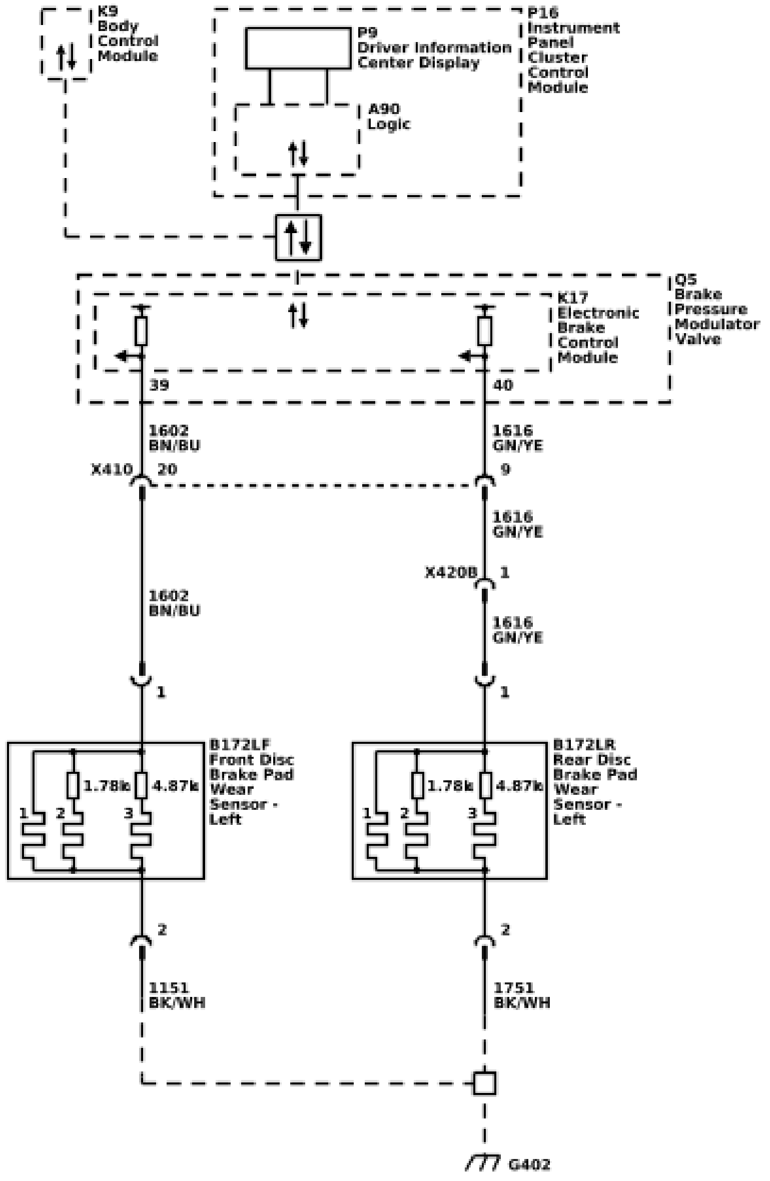
The instrument cluster turns the traction/stability control indicator ON when the following occurs:

- The instrument cluster performs the bulb check.
- The ABS system is in traction control or stability control mode.
- The electronic brake control module detects a traction/stability control disabling malfunction and sends a serial data message to the instrument cluster requesting illumination.

Disc Brakes

Schematic and Routing Diagrams

Disc Brake Schematics (Brake Pad Wear Sensors)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Cluster
Control
Module
P9
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Center Display
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Logic
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Brake
Pressure
Modulator
Valve
K17
Electronic
Brake
Control
Module
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X420B
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BN/BU
1616
GN/YE
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1
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Front Disc
Brake Pad
Wear
Sensor -
Left
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4.87k
1
2
3
B172LR
Rear Disc
Brake Pad
Wear
Sensor -
Left
1.78k
4.87k
1
2
3
2
2
1151
BK/WH
1751
BK/WH
G402

6846212

Description and Operation

Brake Pad Life Monitoring Description and Operation

This vehicle has a system that estimates the remaining life of the front and rear brake pads. When the feature is active, brake pad life is displayed in the Driver Information Center (DIC), along with a percentage and distance for each axle.

When the system has determined that the brake pads need to be replaced, a message will display, which may include mileage remaining.

Customers can use this information to plan their vehicle maintenance. A prognostic indicator of life remaining, especially in distance remaining, enables customers to arrange brake pad replacement at a convenient time.

The system will display a percent pad life on the DIC at all time just like oil life monitoring. When you approach end of pad life, the messaging will change to a distance parameter (i.e. 2000 miles remaining, etc.) and it will start to actively remind the driver to take action at ignition cycle intervals.

If the feature has malfunctioned, fault messaging will be provided. The customer will be able to disable the feature display if desired, and the display will confirm this.

The Brake System Control Module has one analog input for a front axle brake pad wear sensor and one analog input for a rear axle brake pad wear sensor. The brake system control module supply voltage to the brake pad wear sensor and the sensor is grounded to the vehicle ground. The brake system control module diagnose any issues with the power supply for the sensors and set “ invalid” if there is a failure detected in the supply voltage system.

After replacing the brake pads, the Axle Brake Pad Life Monitor Reset Learn must be performed.

The brake pad life system can be turned off. This may be necessary if aftermarket brake pads without wear sensors are installed. When the system is turned off, the front and rear brake pad life percentages will not display.

Disc Brake System Description and Operation

System Component Description

The disc brake system consists of the following components:

Disc Brake Pads: Applies mechanical output force from the hydraulic brake calipers to friction surfaces of brake rotors.

Disc Brake Rotors: Uses mechanical output force applied to friction surfaces from the disc brake pads to slow speed of tire and wheel assembly rotation.

Disc Brake Pad Hardware: Secures disc brake pads firmly in proper relationship to the hydraulic brake calipers. Enables a sliding motion of brake pads when mechanical output force is applied.

Disc Brake Caliper Hardware (Floating Caliper): Provides mounting for hydraulic brake caliper and secures the caliper firmly in proper relationship to caliper bracket. Enables a sliding motion of the brake caliper to the brake pads when mechanical output force is applied.

System Operation (Floating Caliper)

Mechanical output force is applied from the hydraulic brake caliper pistons to the inner brake pads. As the pistons press the inner brake pads outward, the caliper housings draw the outer brake pads inward. This allows the output force to be equally distributed. The brake pads apply the output force to the friction surfaces on both sides of the brake rotors, which slows the rotation of the tire and wheel assemblies. The correct function of both the brake pad and brake caliper hardware is essential for even distribution of braking force.

System Operation (Fixed Caliper)

Mechanical output force is applied from the hydraulic brake caliper inboard and outboard pistons to the inner and outer brake pads. The brake calipers are a fixed, opposed-piston design, allowing the output force to be equally distributed through the distribution of the pressurized brake fluid within the caliper. The brake pads apply the output force to the friction surfaces on both sides of the brake rotors, which slows the rotation of the tire and wheel assemblies. The correct function of the brake pad hardware and of the brake caliper inboard and outboard pistons is essential for even distribution of braking force.

System Characteristics

Brake Noise

Brake noise can occur and to a degree, some brake noise is normal. Variations in driving conditions such as the weather, environment, driving patterns, differences in vehicle loading, and type or style of driving, can affect brake wear. Any one of these variations can cause brake noise to become apparent. Inspect and verify that all metal-to-metal contact areas of the brake pads, brake pad guides or springs, brake caliper housing, caliper bracket and/or suspension knuckle, as applicable, are clean and free of corrosion and scale.

Brake noise is a “slip-stick” vibration of disc brake components and, if it occurs intermittently, can be considered normal. Most brake noise may be eliminated or temporarily reduced by performing 3 or 4 aggressive brake applications. If the brake noise persists or consistently recurs, application of a damping compound to the brake pad mounting plate where it contacts the caliper can lessen the vibration as the components move relative to each other. Refer to [Link target (target-id 176959-) not found] in this section for recommended compounds.

The following brake noises are characteristic of all brake systems. These noises cannot be avoided, and may not indicate improper operation of the brake system.

Squeak/Squeal Noise
A squeak or squeal noise can occur on vehicles with front semi-metalic brake pads during light to medium brake pedal application at low to moderate vehicle speeds. Occasionally this noise may appear from the front or rear brakes after a period of non-use such as overnight, or cold brakes and/or in high humidity conditions.

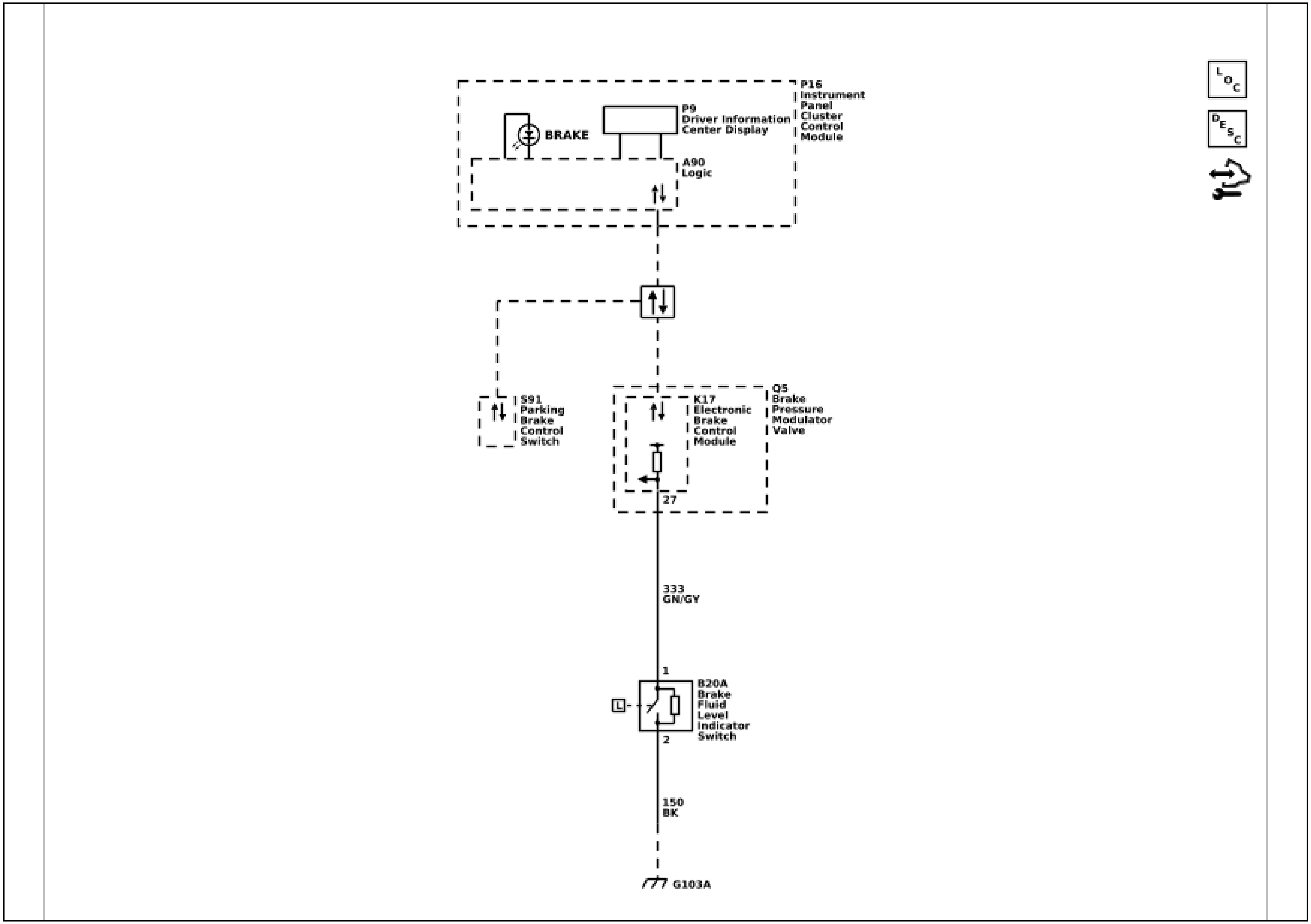
Grinding Noise
Common occurrence for rear brakes and some front disc brakes during initial brake applications after the vehicle has been parked overnight. Caused by light corrosion forming on the metal brake component friction surfaces during vehicle non-use. Typically disappears after the first few brake applications.

Groan Noise
A groan type noise may be heard during a quick stop, or when slowly moving forward from a complete stop. On vehicles equipped with antilock brake systems (ABS), a groan or moan noise may occur during heavy brake application or on road surfaces with compromised traction such as loose gravel, or on wet or icy roads. This is a normal function of ABS activation.

Hydraulic Brakes

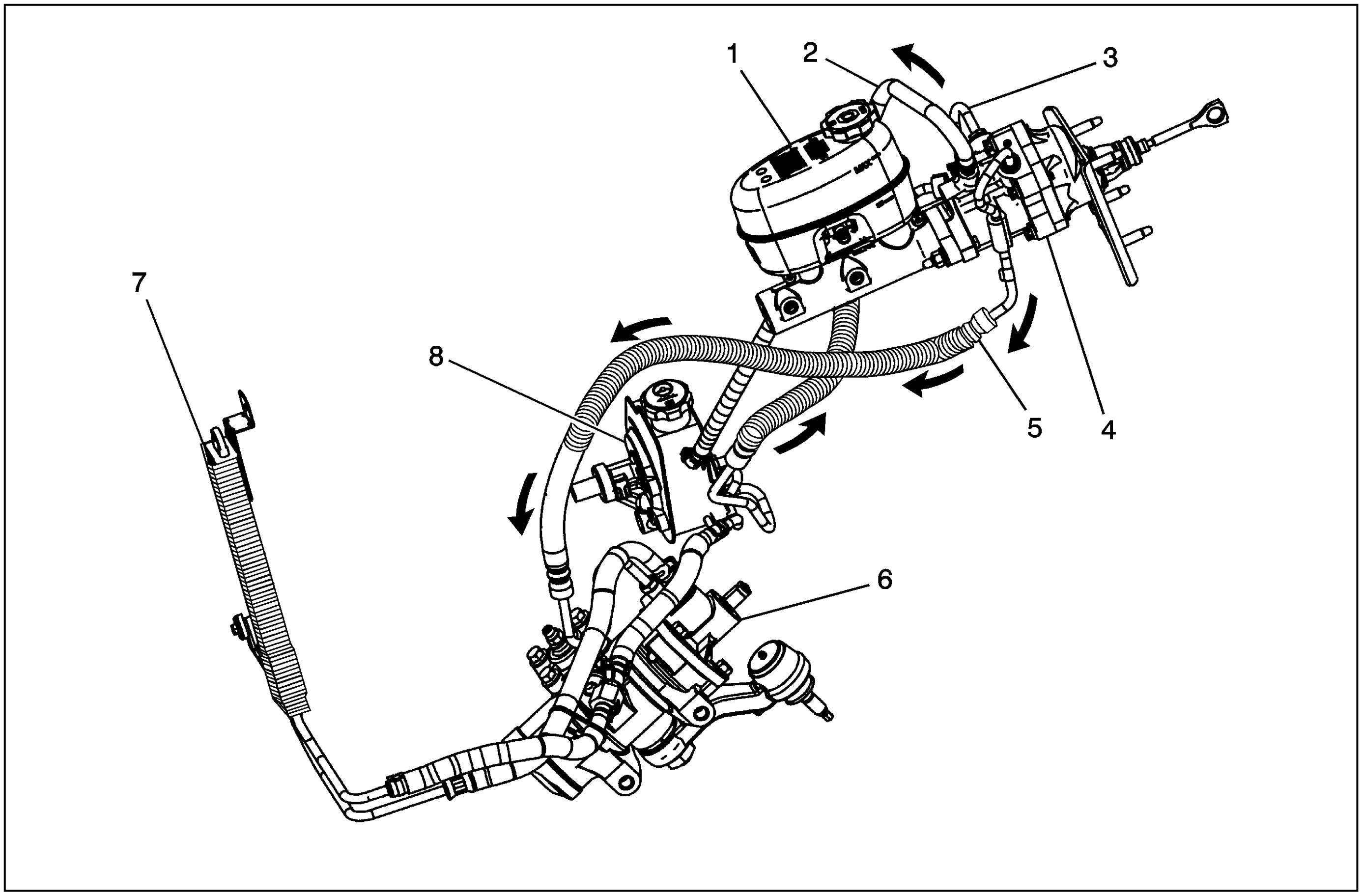
Schematic and Routing Diagrams

Hydraulic Brake Schematics (Hydraulic Brakes)


P16
Instrument
Panel
Cluster
Control
Module
P9
Driver Information
Center Display
BRAKE
A90
Logic
S91
Parking
Brake
Control
Switch
K17
Electronic
Brake
Control
Module
Q5
Brake
Pressure
Modulator
Valve
27
333
GN/GY
1
L
B20A
Brake
Fluid
Level
Indicator
Switch
2
150
BK
G103A
6846213

Description and Operation

Brake Assist System Description and Operation



(1) Master Cylinder

(2) Power Brake Booster Outlet Hose

(3) Power Brake Booster Inlet Pipe/Hose

(4) Hydraulic Brake Booster

(5) Power Steering Gear Inlet Pipe/Hose

(6) Steering Gear

(7) Power Steering Cooler

(8) Power Steering Pump

System Component Description

The brake assist system consists of the following:

Brake Pedal: Receives, multiplies and transfers brake system input force from driver.

Brake Pedal Pushrod: Transfers multiplied input force received from brake pedal to brake booster.

Hydraulic Brake Booster: Uses power steering fluid pressure to decrease effort required by driver when applying brake system input force.

Power Steering System: Supplies pressurized power steering fluid used by hydraulic brake booster to decrease brake pedal effort.

System Operation

The hydraulic brake boost system uses fluid from the power steering pump (8) through the hydraulic boost inlet hose (3) and to the brake booster assembly (4). In addition to supplying the brake system with fluid for increased apply, the power steering pump is also connected to the power steering gear (6) and cooler (7).

The steering pump (8) is a continuous flow device supplying approximately 3 GPM at 1000 RPM, at the pump shaft. The fluid flows through the booster spool valve, then the return hose (5), and then to the steering gear (6). Pressure is produced by applying the brake pedal, resulting in the spool valve being actuated, internal to the hydraulic brake booster. The spool valve produces a marginal restriction that causes pressure in the booster (4) to rise and forces the power piston and therefore the output rod forward to generate force and motion at the master cylinder (1). The brake corners are actuated by the fluid impulse generated by the master cylinder (1). Internal blow by, or pressure relief, is directed to the low pressure return hose (2) back to the power steering pump (8).

Hydraulic Brake System Description and Operation

System Component Description

The hydraulic brake system consists of the following:

Hydraulic Brake Master Cylinder Fluid Reservoir: Contains supply of brake fluid for the hydraulic brake system.

Hydraulic Brake Master Cylinder: Converts mechanical input force into hydraulic output pressure.Hydraulic output pressure is distributed from the master cylinder through 2 hydraulic circuits, supplying front-rear opposed wheel apply circuits.

Hydraulic Brake Pressure Balance Control System: Regulates brake fluid pressure delivered to hydraulic brake wheel circuits, in order to control the distribution of braking force.Pressure balance control is achieved through dynamic rear proportioning (DRP), which is a function of the ABS modulator.

Hydraulic Brake Pipes and Flexible Brake Hoses: Carries brake fluid to and from hydraulic brake system components.

Hydraulic Brake Wheel Apply Components: Converts hydraulic input pressure into mechanical output force.

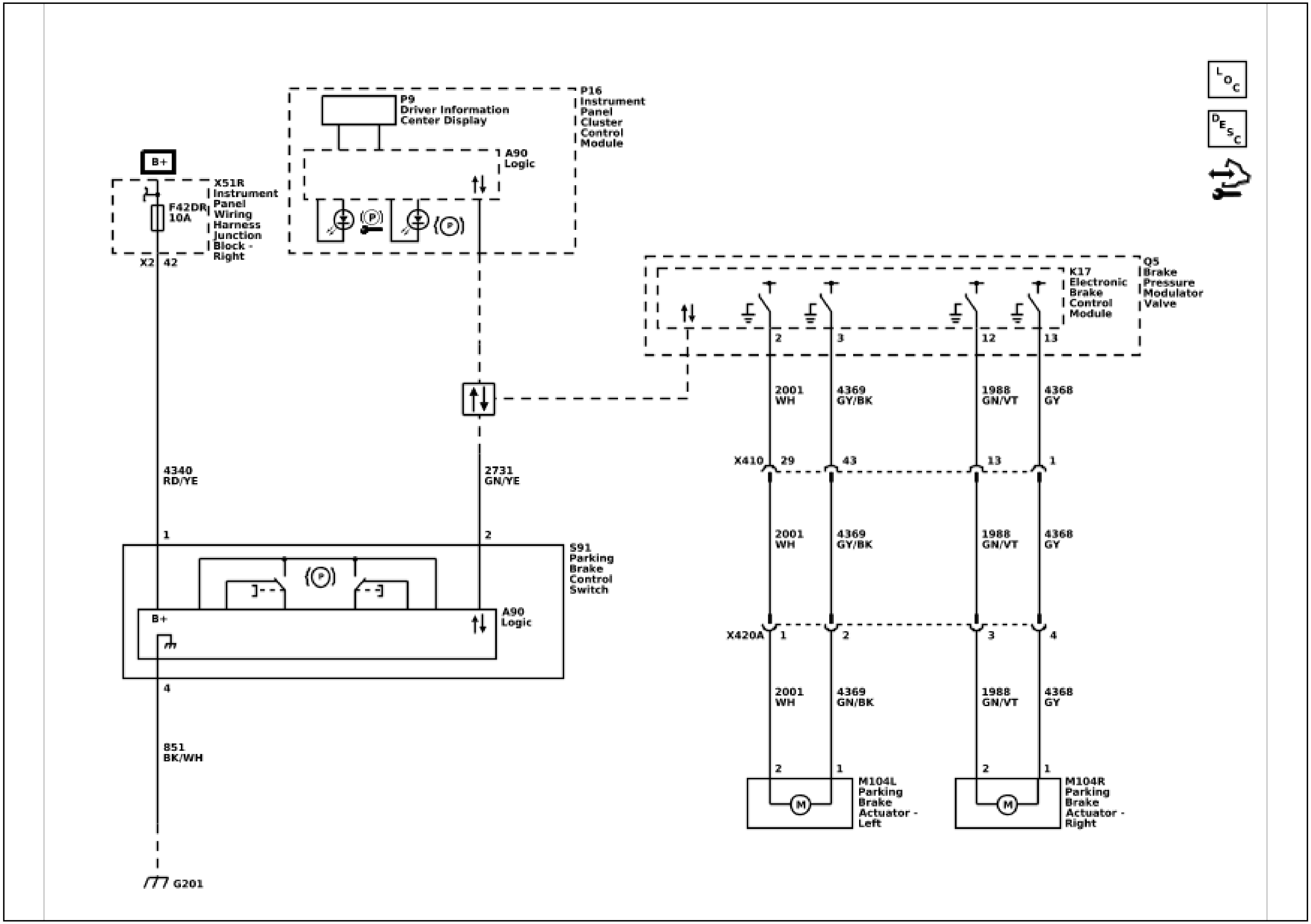
System Operation

Mechanical force is converted into hydraulic pressure by the master cylinder, regulated to meet braking system demands by the pressure balance control system, and delivered to the hydraulic brake wheel circuits by the pipes and flexible hoses. The wheel apply components then convert the hydraulic pressure back into mechanical force which presses linings against rotating brake system components.

Park Brake

Schematic and Routing Diagrams

Park Brake System Schematics (Electric Park Brake)


L O C
D E S C
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F42DR 10A
X2 42
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
P
P
4340 RD/YE
2731 GN/YE
1
2
S91 Parking Brake Control Switch
P
A90 Logic
B+
4
851 BK/WH
G201
Q5 Brake Pressure Modulator Valve
K17 Electronic Brake Control Module
2
3
12
13
2001 WH
4369 GY/BK
1988 GN/VT
4368 GY
X410
29
43
13
1
2001 WH
4369 GY/BK
1988 GN/VT
4368 GY
X420A
1
2
3
4
2001 WH
4369 GN/BK
1988 GN/VT
4368 GY
2
1
M
M104L Parking Brake Actuator - Left
2
1
M
M104R Parking Brake Actuator - Right

6846214

Description and Operation

Electronic Parking Brake Description

Vehicles with the electric parking brake have a switch in the center console or on the dash, which takes the place of the manual parking brake system, the foot pedal and release handle. In case of insufficient electrical power, the electric parking brake cannot be applied or released.

Electronic Brake Control Module/Brake System Control Module

The parking brake function is integrated into the Electronic Brake Control Module/Brake System Control Module. The module contains the logic for applying and releasing the parking brake when commanded by the Park Brake Switch.

When the Park Brake Switch is pulled, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the apply control circuits and ground to the release control circuits which will cause the left and right park brake actuators to activate causing the park brakes to engage. When the Park Brake Switch is pressed, a signal is sent to the Electronic Brake Control Module which will supply 12 V to the released control circuits and ground to the apply control circuits which will cause the left and right park brake actuators to activate causing the park brakes to release. In some vehicles, the Park Brake Switch is a push-button style switch. When the switch is pressed, the park brakes are commanded to either apply or release based off of their current position.

The Electronic Brake Control Module/Brake System Control Module will diagnose the park brake motor circuits to verify that they are functioning properly. The park brake motor circuits are used to command actuator motor operation, which will apply and release the parking brake. These circuits are used to activate the actuator, which applies or releases park brake shoes.

The Park Brake Motor Position Sensor is an internal sensor to the park brake actuator, this sensor is used to monitor the park brake motor position.

Electric Parking Brake Apply

The electric parking brake can be applied any time the vehicle is stopped or in motion. The electric parking brake is applied by momentarily operating the park brake control switch. The red park brake light will momentarily flash while the parking brake is being applied. Once fully applied, the red park brake light will turn on. If the electric parking brake is applied while the vehicle is in motion, the vehicle will decelerate as long as the switch is being operated. If the switch is operated until the vehicle comes to a stop, the park brake will remain applied.

If the red park brake light is flashing, the electric parking brake is only partially applied or released, or there is a problem with the electric parking brake. A DIC message will display.

The vehicle may automatically apply the electric parking brake in some situations when the vehicle is not moving. This is normal, and is done to periodically check the correct operation of the electric parking brake system.

Electric Parking Brake Release

To release the electric parking brake, turn the ignition switch to the ON or RUN position, apply and hold the brake pedal, and push down momentarily on the park brake control switch. When the electric parking brake is released the red park brake light turns off.

Automatic Electric Parking Brake Release

The parking brake will automatically release if the vehicle is running, placed into gear, and an attempt is made to drive away. Avoid rapid acceleration when the parking brake is applied to preserve parking brake lining life.

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- *Diagnostic System Check - Vehicle 3-255*
- *Diagnostic Trouble Code (DTC) List - Vehicle 3-260*
- *Symptoms - Vehicle 3-318*

Control Module References

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
A11	*A11 Radio: Scan Tool Information 3-56*	*Radio/Navigation System Schematics (IOR) 5-3* *Radio/Navigation System Schematics (IOK) 5-8*	[Link target (target-id 46758-) not found]	*A11 Radio: Programming and Setup 3-6*
B174W	*B174W Frontview Camera: Scan Tool Information 3-60*	*Driver Assistance Systems Schematics 10-3*	[Link target (target-id 283748-) not found]	*B174W Frontview Camera - Windshield: Programming and Setup 3-10*
B218L/R	*B218L Side Object Sensor Module - Left: Scan Tool Information 3-61* *B218R Side Object Sensor Module - Right: Scan Tool Information 3-62*	*Driver Assistance Systems Schematics 10-3*	[Link target (target-id 283745-) not found]	*B218L Side Object Sensor Module - Left: Programming and Setup 3-11* *B218R Side Object Sensor Module - Right: Programming and Setup 3-12*
K4	*K4 Assist Step Control Module: Scan Tool Information 3-62*	[Link target (target-id 145954-) not found]	[Link target (target-id 258421-) not found]	*K4 Assist Step Control Module: Programming and Setup 3-12*
K9	*K9 Body Control Module: Scan Tool Information 3-63*	*Body Control System Schematics 8-23*	[Link target (target-id 148090-) not found]	*K9 Body Control Module: Programming and Setup 3-14*
K17	*K17 Electronic Brake Control Module: Scan Tool Information 3-103*	*Antilock Brake System Schematics 2-3*	[Link target (target-id 183714-) not found]	*K17 Electronic Brake Control Module: Programming and Setup 3-17*
K20	*K20 Engine Control Module: Scan Tool Information (L5P) 3-105* *K20 Engine Control Module: Scan Tool Information (L8T) 3-153*	• *Engine Controls Schematics 6-11* – 6.6L (L8T) engine • *Engine Controls Schematics 6-29* – 6.6L (L5P) Diesel engine	[Link target (target-id 227993-) not found] – 6.6L (L8T) engine [Link target (target-id 186772-) not found] – 6.6L (L5P) Diesel engine	*K20 Engine Control Module: Programming and Setup 3-18*
K29FV	Front Seat Heater Vent Control Module	*Heated/Cooled Seat Schematics 11-15*	[Link target (target-id 271038-) not found]	*K29FV Front Seat Heater Vent Control Module: Programming and Setup 3-20*
K36	*K36 Restraints Control Module: Scan Tool Information 3-205*	*SIR Schematics 10-51*	[Link target (target-id 57768-) not found]	*K36 Restraints Control Module: Programming and Setup 3-20*
K40	*K40D Driver Seat Adjuster Memory Module: Scan Tool Information 3-212*	*Driver Seat Schematics 11-3*	[Link target (target-id 265094-) not found]	*K40D Driver Seat Adjuster Memory Module: Programming and Setup 3-22*

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K43	*K43 Power Steering Control Module: Scan Tool Information 3-217*	*Power Steering Schematics 12-3*	[Link target (target-id 168597-) not found]	*K43 Power Steering Control Module: Programming and Setup 3-23*
K44	*K44 Power Take-off Control Module: Scan Tool Information 3-219*	*Power Take-Off (PTO) Schematics 14-3*	[Link target (target-id 167837-) not found]	*K44 Power Take-off Control Module: Programming and Setup 3-24*
K56	Serial Data Gateway Module	*Data Communication Schematics 8-3*	[Link target (target-id 148099-) not found]	*K56 Serial Data Gateway Module: Programming and Setup 3-28*
K56U	Special Purpose Vehicle Module	*Data Communication Schematics 8-3*	[Link target (target-id 351765-) not found]	*K56U Special Purpose Vehicle Module: Programming and Setup 3-30*
K60	*K60 Column Lock Module: Scan Tool Information 3-220*	*Column Lock Schematics 12-9*	[Link target (target-id 129581-) not found]	*K60 Column Lock Module: Programming and Setup 3-31*
K61	Sunroof Control Module	*Sunroof Schematics 9-3*	[Link target (target-id 69635-) not found]	*K61 Sunroof Control Module: Programming and Setup 3-32*
K67	Trailer Brake Control Module	*Trailering Systems Schematics 1-59*	[Link target (target-id 327489-) not found]	*K67 Trailer Brake Control Module: Programming and Setup 3-32*
K68	*K68 Trailer Lighting Control Module: Scan Tool Information 3-220*	*Trailering Systems Schematics 1-59*	[Link target (target-id 327487-) not found]	*K68 Trailer Lighting Control Module: Programming and Setup 3-32*
K69	*K69 Transfer Case Control Module: Scan Tool Information 3-221*	• *Transfer Case Control Schematics 14-10* – MP 1625/1626 (NQF) transfer case • *Transfer Case Control Schematics 14-24* – MP 3023/3024 (NQH) transfer case	[Link target (target-id 162309-) not found] – MP 1625/1626 (NQF) transfer [Link target (target-id 162319-) not found] – MP 3023/3024 (NQH) transfer case	*K69 Transfer Case Control Module: Programming and Setup (NQF) 3-32* *K69 Transfer Case Control Module: Programming and Setup (NQH) 3-33*
K71	*K71 Transmission Control Module: Scan Tool Information (10L1000 (MGM, MGU, MKM)) 3-227*	[Link target (target-id 315149-) not found]	[Link target (target-id 315106-) not found]	*K71 Transmission Control Module: Programming and Setup (10L1000 (MGM MGU, MKM)) 3-35*
K73	*K73 Telematic Control Module: Scan Tool Information 3-235*	*OnStar/Telematics Schematics 5-15*	[Link target (target-id 328020-) not found]	*K73 Telematic Control Module: Programming and Setup 3-36*
K85P	*K85P Restraints Occupant Classification System Module - Passenger: Scan Tool Information 3-237*	*SIR Schematics 10-51*	[Link target (target-id 188211-) not found]	*K85P Restraints Occupant Classification System Module - Passenger: Programming and Setup 3-37*
K111	*K111 Fuel Pump Power Control Module Scan Tool Information 3-245*	• *Engine Controls Schematics 6-11* – 6.6L (L8T) engine • *Engine Controls Schematics 6-29* – 6.6L (L5P) Diesel engine	(AKA: Fuel Pump Driver Control Module) [Link target (target-id 228095-) not found] – 6.6L (L8T) engine [Link target (target-id 284808-) not found] – 6.6L (L5P) Diesel engine	*K111 Fuel Pump Power Control Module: Programming and Setup 3-49*

Code	Control Module/Scan Tool Information	Schematic	Repair Instruction	Programming and Setup
K115	Reductant Control Module	*Engine Controls Schematics 6-29* – 6.6L (L5P) Diesel engine	[Link target (target-id 284657-) not found]	*K115 Reductant Control Module: Programming and Setup 3-39*
K157	Video Processing Control Module	*Image Display Camera Schematics 5-46*	[Link target (target-id 283882-) not found]	*K157 Video Processing Module: Programming and Setup 3-40*
K182	*K182 Parking Assist Control Module: Scan Tool Information 3-237*	*Parking Assistance Systems Schematics 10-25*	[Link target (target-id 283577-) not found]	*K182 Parking Assist Control Module: Programming and Setup 3-41*
K194	*K194 Rear Gate Module: Scan Tool Information 3-241*	*Endgate Schematics 1-84*	[Link target (target-id 162445-) not found]	*K194 Rear Gate Module: Programming and Setup 3-42*
K219	*K219 Lighting Control Module: Scan Tool Information 3-201*	*Exterior Lights Schematics 1-21*	[Link target (target-id 321424-) not found]	*K219 Lighting Control Module: Programming and Setup 3-43*
K234	*K234 Rear Seat Heater Vent Control Module: Scan Tool Information 3-203*	*Heated/Cooled Seat Schematics 11-15*	[Link target (target-id 149771-) not found]	*K234 Rear Seat Heater Vent Control Module: Programming and Setup 3-45*
P16	*P16 Instrument Panel Cluster Control Module: Scan Tool Information 3-242*	*Instrument Cluster Schematics 5-33*	[Link target (target-id 50650-) not found]	*P16 Instrument Panel Cluster Control Module: Programming and Setup 3-45*
T1	Accessory AC and DC Power Control Module	*Cigar Lighter/Power Outlet Schematics 8-728*	[Link target (target-id 121154-) not found]	*T1 Accessory AC and DC Power Control Module: Programming and Setup 3-47*
T3	*T3 Audio Amplifier: Scan Tool Information 3-243*	*Radio/Navigation System Schematics (IOR) 5-3* *Radio/Navigation System Schematics (IOK) 5-8*	[Link target (target-id 46705-) not found]	*T3 Audio Amplifier: Programming and Setup 3-47*
T22	*T22 Wireless Accessory Charging Module: Scan Tool Information 3-244*	*Cigar Lighter/Power Outlet Schematics 8-728*	[Link target (target-id 224804-) not found]	*T22 Wireless Accessory Charging Module: Programming and Setup 3-48*

Repair Instructions

A11 Radio: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- Programming must begin with the Ignition/Vehicle OFF. Programming will direct the appropriate control module(s) to change power mode as needed during the procedure, independent of the vehicle's power mode.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Diagnostic Aids

- Check for Preliminary information or Technical Service bulletins before programming.

- During programming you may be required to select multiple calibrations dependent upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.
- If the control module calibration is only being updated, USB programming may not be required, depending on the current software level, or the release of updates. If USB programming may not be required when replacing/reprogramming the control module. If USB files for the application are not available via SPS, or have not been received from General Motors in another manner, the USB process will not need to be performed unless instructed otherwise in a service document or publication.
- Begin with the vehicle in the vehicle OFF power mode. The Service Programming System will power mode the vehicle.
- The vehicle can be moved to an alternate location when performing the USB portion of the programming steps which could allow the possibility of working on another vehicle while the USB programming event is taking place.
- When transferring a large file (>1GB) from the Techline Connect server to the PC then to a USB stick, below are some useful tips:
  - A wired connection to the network is the quickest, most stable way to download the file.
  - Wireless connections can be used, however slower connection speeds may increase the likelihood of errors to occur during file download.
  - Once the file is downloaded to the PC, it will reside in cashe unless the cashe is cleared. Any additional USB sticks made from that PC will be copied from cashe and take a much shorter time compared to downloading from the server.
  - Never take a USB stick directly to a vehicle for updating without starting a Techline Connect session for that particular VIN. If software is already on the stick, Techline Connect will take only seconds to confirm software on the stick is the latest and correct for that vehicle. Failure to perform this step will result in no warranty claim code indicating a USB programming event was completed.
  - If equipped with an SD Card slot, the SD card must be installed and functioning correctly for USB programming to be successful.

Reference Information

Special Tools

- USB type A or type C flash drive (whichever applicable) .
- USB 2.0 & above with FAT32 format (USB 3.0 & 3.1 is highly recommended)
- Minimum size 16GB (Most USB flash drives larger than 32GB do not support FAT32 format)
- EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

For equivalent regional tools, refer to *Special Tools 3-54*.

Reprogram Control Module

To program an existing control module, perform the following procedure:

Note: The vehicle must remain in PARK and the driver’s door closed during the programming procedure.

1. Ignition/vehicle OFF
2. Access the Service Programming System (SPS) and follow the on-screen instructions.

Note: If the radio displays “calibrate device, one or more devices need to be calibrated" in SPS program the radio selecting replace and program.

3. On the SPS Supported Controllers screen, select A11 Radio – Programming and then follow the on-screen instructions.
4. Before proceeding with USB programming check for any Info Sys OTA updates under Settings>Updates on the vehicles infotainment screen. If an update is available, it is more efficient to install the OTA update if it will install successfully. If the OTA will not install and USB programming is necessary then before attempting USB programming you should first decline the update by selecting Details and then the Decline Update option, followed by confirming the Decline Update. If an Info Sys OTA update is not available, proceed with USB programming.

Note:

- If equipped with an SD Card slot, the SD card must be installed and functioning correctly for USB programming to be successful.
- If using a pre-configured USB drive supplied by General Motors, proceed to step 6.

5. Connect a USB drive to the computer.
6. Access the Service Programming System (SPS) and follow the on-screen instructions.
7. On the SPS Supported Controllers screen, select A11 Radio – USB Copy/ USB File Transfer.

Note:

- If USB programming is unavailable, or if the selected software description is the following proceed to step 6: *STOP. If you are seeing this text, the controller already has the latest software available. If you try to proceed further, SPS will generate an error.*.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

8. Upon completion of the file transfer, remove the USB drive from the computer.
9. Connect the USB drive to the USB port in the vehicle.
10. Ignition ON, infotainment system ON.

Note: The Radio will not allow the installation of the same software version via USB. If the same software is detected the installation process will not start.

11. The infotainment system will recognize that update files are available. Follow the infotainment display on-screen instructions and select Update when prompted. Programming will take several minutes.

Note: Once the update is initiated, there is no need to monitor the progress.

Note: If no instructions immediately appear on the infotainment display, select the following menu options:

- Home
- Settings
- System
- Updates

12. Upon completion of programming, remove the USB drive. Follow the infotainment display on-screen instructions.
13. Clear DTCs.
14. Perform the Manufacturer Enable Counter (MEC) reset – Access the Global Diagnostic System 2 (GDS 2) and identify the vehicle
15. On the GDS 2 screen select Module Diagnostics – Radio (select appropriate RPO) – Configuration/ reset functions – Reset Manufacturer Enable Counter and follow the on–screen instructions.

Note: You may receive a message stating the Reset Manufacturer Enable Counter (MEC) procedure is not required if the MEC counter is already at 0.

16. Ignition OFF, Retained Accessory Power (RAP) OFF, remove the key fob from range of the vehicle, and let the vehicle sit for five minutes. Retest system operation to verify the repair.

Replace and Program Control Module

To program a replacement control module, perform the following procedure:

Note: The vehicle must remain in PARK and the driver's door closed during the programming procedure.

1. Ignition/vehicle OFF
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select A11 Radio – Programming and then follow the on-screen instructions.

Note:

- If equipped with an SD Card slot, the SD card must be installed and functioning correctly for USB programming to be successful.
- If using a pre-configured USB drive supplied by General Motors, proceed to step 5.

4. Connect a USB drive to the computer.
5. Access the Service Programming System (SPS) and follow the on-screen instructions.
6. On the SPS Supported Controllers screen, select A11 Radio – USB Copy/ USB File Transfer.

Note:

- If USB programming is unavailable, or if the selected software description is the following proceed to step 5: *STOP. If you are seeing this text, the controller already has the latest software available. If you try to proceed further, SPS will generate an error.*.
- Software currently loaded on the USB Drive will be verified and if files are incorrect they will be deleted and correct files will be loaded. If files residing on the USB Drive are correct for the vehicle being serviced, the Techline terminal will not delete those files and allow the drive to be re-used.

7. Upon completion of the file transfer, remove the USB drive from the computer.
8. Connect the USB drive to the USB port in the vehicle.
9. Ignition ON, infotainment system ON.

Note: The Radio will not allow the installation of the same software version via USB. If the same software is detected the installation process will not start.

10. The infotainment system will recognize that update files are available. Follow the infotainment display on-screen instructions and select Update when prompted. Programming will take several minutes.

Note: Once the update is initiated, there is no need to monitor the progress.

Note: If no instructions immediately appear on the infotainment display, select the following menu options:

- Home
- Settings
- System
- Updates

11. Upon completion of programming, remove the USB drive. Follow the infotainment display on-screen instructions.
12. Clear DTCs.
13. Perform the Manufacturer Enable Counter (MEC) reset – Access the Global Diagnostic System 2 (GDS 2) and identify the vehicle
14. On the GDS 2 screen select Module Diagnostics – Radio (select appropriate RPO) – Configuration/ reset functions – Reset Manufacturer Enable Counter and follow the on–screen instructions.

Note: You may receive a message stating the Reset Manufacturer Enable Counter (MEC) procedure is not required if the MEC counter is already at 0.

15. Ignition OFF, Retained Accessory Power (RAP) OFF, remove the key fob from range of the vehicle, and let the vehicle sit for five minutes. Retest system operation to verify the repair.

XM Activation (If Equipped)

Important: On the radio being replaced, record the XM ID from the radio parts label or before removal tune to XM channel 0. This will be used during the call to XM radio to deactivate the receiver that has been removed from the vehicle.

1. Turn the replacement radio ON, tune to the XM channel 0, and record the radio ID. The radio ID will be needed for activation of the receiver.
2. Contact SiriusXM Dealer Support at (800) 852–9696 to activate the new receiver.
3. Park the vehicle outside in an area with an unobstructed view of the southern sky.
4. Leave the vehicle outside with the ignition switch in the ACC position and the radio on for 30 minutes to activate XM service.
5. Once activated, the radio will receive the remaining XM channels.

Unsuccessful Programming Recovery

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module. Refer to [Link target (target-id 300812-) not found] to diagnose these Ethernet circuits.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming System (SPS) and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the control module.

Note: All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This can vary depending on vehicle and control module location and can be done by one of the options listed below:

- Removing all fuses supplying battery voltage and ignition voltage to the control module.
- Disconnecting all harness connectors from the control module.
- Performing a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .

3. Reconnect all battery voltage and ignition voltage sources to the control module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the control module, data link connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the control module.
8. Verify the control module can be programmed.

⇒ **If the control module can not be programmed**

  8.1. Ignition ON/Vehicle in Service Mode for 1 min.

  8.2. Ignition/Vehicle OFF.

  8.3. Access SPS and follow the on-screen instructions for the control module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.

8.4. Verify the control module can be programmed.

⇒ If the control module can not be programmed, replace the control module.

⇓ If the control module can be programmed

8.5. Clear DTCs.

⇓ **If the control module can be programmed**

9. Clear DTCs.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming, and setup.

A26 Heater and Air Conditioning User Interface Control - Front: Programming and Setup

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: *Diagnostic System Check - Vehicle 3-255*
- Review the description of Strategy Based Diagnosis: *Strategy Based Diagnosis 3-245*

Note:

- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn Off or disable systems that may put a load on the vehicle's battery. For example, interior lights, daytime running lights, HVAC, and radio.
- During the programming procedure, follow the Service Programming System (SPS) prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.

Programming an Existing or New Control Module

This control module does not require SPS programming or any setup procedures.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: *Diagnostic Repair Verification 3-319*

For control module replacement, programming, and setup refer to: *Control Module References 3-4*

B174W Frontview Camera - Windshield: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required install the *EL-49642* SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.
- Anytime the B174W Frontview Camera – Windshield is removed from its mount, the [Link target (target-id 283712-) not found] procedure must be performed.

Following Replacement of Windshield

The B174W Frontview Camera – Windshield must be calibrated, refer to [Link target (target-id 283712-) not found] .

Programing an Existing or New Control Module

To program a replacement or an existing B174W Frontview Camera – Windshield, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select B174W Frontview Camera – Windshield Programming and follow the on-screen instructions.
3. Clear DTCs

Note: After programming, a current DTC may be set in the B174W Frontview Camera – Windshield that is unable to be cleared. This is normal and an indicator that the B174W Frontview Camera – Windshield is in learn mode.

4. Following B174W Frontview Camera – Windshield replacement and/or reprogramming, the module must be calibrated. Refer to [Link target (target-id 283712-) not found] .

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all B174W Frontview Camera – Windshield, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the B174W Frontview Camera – Windshield.
3. If the B174W Frontview Camera – Windshield can still not be programmed, turn the ignition OFF for at least one minute.
4. Turn the ignition ON and attempt to reprogram the B174W Frontview Camera – Windshield. The B174W Frontview Camera – Windshield should program.
   - ⇒ If the B174W Frontview Camera – Windshield still cannot be programmed, replace the B174W Frontview Camera – Windshield.

B218L Side Object Sensor Module - Left: Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install the *EL-49642* SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program ECU or Reprogram ECU

To program a replacement or an existing ECU, perform the following procedure:

Note:

- Due to continuous improvements, the on screen selections may vary from instructions below.
- It is required to program both the B218L Side Object Sensor Module - Left and B218R Side Object Sensor Module - Right when a programming event is required.

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select B218L Side Object Sensor Module - Left.
3. On the SPS Select Function / Sequence screen, select Programming
4. Clear DTCs.
5. On the SPS Supported Controllers screen, select B218R Side Object Sensor Module - Right.
6. On the SPS Select Function / Sequence screen, select Programming
7. Clear DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the ECU.
3. If the ECU can still not be programmed, turn the ignition OFF for at least one minute.
4. Turn the ignition ON and attempt to reprogram the ECU. The ECU should program.
   ⇒ If the ECU still cannot be programmed, replace the ECU.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming, and setup

B218R Side Object Sensor Module - Right: Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install the *EL-49642* SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Replace and Program ECU or Reprogram ECU

To program a replacement or an existing ECU, perform the following procedure:

Note:

- Due to continuous improvements, the on screen selections may vary from instructions below.
- It is required to program both the B218L Side Object Sensor Module - Left and B218R Side Object Sensor Module - Right when a programming event is required.

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select B218L Side Object Sensor Module - Left.
3. On the SPS Select Function / Sequence screen, select Programming
4. Clear DTCs.
5. On the SPS Supported Controllers screen, select B218R Side Object Sensor Module - Right.
6. On the SPS Select Function / Sequence screen, select Programming
7. Clear DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the ECU.
3. If the ECU can still not be programmed, turn the ignition OFF for at least one minute.
4. Turn the ignition ON and attempt to reprogram the ECU. The ECU should program.
   ⇒ If the ECU still cannot be programmed, replace the ECU.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming, and setup

K4 Assist Step Control Module: Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.

- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, , etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Assist Step Learn

If service was performed in which the assist steps were put into the service position, it is necessary to perform the Self Test learn. Refer to: [Link target (target-id 328895-) not found]

Programming a New Control Module

1. Ignition/Vehicle OFF. Ensure that the key fob is inside the vehicle an not moved for the duration of the programming to prevent an inadvertent power mode change during programming. If the key fob is not inside the vehicle, the serial data authentication configuration procedure which runs automatically at the end of the programming step will fail even though the programming appears to run successfully. If the serial data authentication configuration procedure fails, DTC U1962 will set and / or the setup step will fail or be incomplete.
    - 1.1. Disconnect Wi-Fi dongle from MDI 2. Install EL-52100 (MDI 2) using wired USB Connection from MDI 2 to computer / laptop. Using the EL-49755 (MDI) will result in a programming failure.
    - 1.2. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12V system during SPS programming events.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, under Select Controller, select K4 Assist Step Control Module.
4. On the SPS Supported Controllers screen, under Select Function / Sequence, select Programming and follow the on-screen instructions.

Note: If the Setup step fails and DTC U1962 sets in the K4 Assist Step Control Module, perform the Serial Data Authentication Configuration procedure and then repeat the Setup step again. Refer to: *Serial Data Authentication Configuration 3-49*

5. On the SPS Supported Controllers screen, under Select Function / Sequence, select Setup and follow the on-screen instructions.
6. At the end of programming, choose the “Clear DTCs” function on the SPS screen.

Programming an Existing Control Module

To program an existing K4 Assist Step Control Module, perform the following procedure.

1. Ignition/Vehicle OFF. Ensure that the key fob is inside the vehicle an not moved for the duration of the programming to prevent an inadvertent power mode change during programming. If the key fob is not inside the vehicle, the serial data authentication configuration procedure which runs automatically at the end of the programming step will fail even though the programming appears to run successfully. If the serial data authentication configuration procedure fails, DTC U1962 will set and / or the setup step will fail or be incomplete.
    - 1.1. Disconnect Wi-Fi dongle from MDI 2. Install EL-52100 (MDI 2) using wired USB Connection from MDI 2 to computer / laptop. Using the EL-49755 (MDI) will result in a programming failure.
    - 1.2. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12V system during SPS programming events.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, under Select Controller, select K4 Assist Step Control Module.
4. On the SPS Supported Controllers screen, under Select Function / Sequence, select Programming and follow the on-screen instructions.
5. At the end of programming, choose the “Clear DTCs” function on the SPS screen.

Unsuccessful Programming Recovery

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming System (SPS) and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the K4 Assist Step Control Module. All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This can vary depending on vehicle and control module location and can be done by one of the options listed below:
   - Removing all fuses supplying battery voltage and ignition voltage to the control module.
   - Disconnecting all harness connectors from the control module.
   - Performing a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .
3. Reconnect all battery voltage and ignition voltage sources to the K4 Assist Step Control Module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the K4 Assist Step Control Module, X84 Data Link Connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the K4 Assist Step Control Module.
8. Verify the K4 Assist Step Control Module can be programmed.

⇒ **If the control module cannot be reprogrammed**

8.1. Ignition OFF for one minute, ignition ON.

8.2. Ignition ON/Vehicle OFF.

8.3. Access SPS and follow the on-screen instructions for the K4 Assist Step Control Module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.
- For optimal consistency during the reprogramming session, we recommend connecting the computer/ laptop to a hardwired Ethernet cable, as the large software file size may affect stability.

8.5. Verify the K4 Assist Step Control Module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the K4 Assist Step Control Module.

⇓ If the K4 Assist Step Control Module can be reprogrammed

8.6. At the end of programming, choose the “Clear DTCs” function on the SPS screen.

⇓ **If the control module can be reprogrammed**

9. At the end of programming, choose the “Clear DTCs” function on the SPS screen.

K9 Body Control Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicle's battery such as interior lights,

exterior lights (including daytime running lights), HVAC, radio, etc.

- Programming must begin with the Ignition/Vehicle OFF. Programming will direct the appropriate control module(s) to change power mode as needed during the procedure, independent of the vehicle’s power mode.
- To prevent programming failure due to unintended wireless drops, it is recommended that a wired MDI 2 connection be used when programming the control module.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.

Reference Information

Special Tools

- *EL-52545*
  Tire Pressure Monitor Sensor and RF Diagnostic Tool or *EL-50448*
  Tire Pressure Monitor Sensor Activation Tool
- *EL-52100* Multiple Diagnostic Interface 2 (MDI 2)

For equivalent regional tools, refer to Special Tools 3-54.

Programming a New Control Module

To program a replacement K9 Body Control Module (BCM), perform the following procedure:

Note:

- Verify all control modules are connected and communicating before attempting to program the control module.
- Begin with the vehicle in vehicle OFF power mode. The Service Programming System will power mode the vehicle.

1. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming. If the key fob is not inside the vehicle, the serial data authentication configuration procedure which runs automatically at the end of the programming step will fail even though the programming appears to run successfully. If the serial data authentication configuration procedure fails, DTC U1962 will set and/or the setup step will fail or be incomplete.
2. Disconnect Wi-Fi dongle if it is currently connected to *EL-52100* Multiple Diagnostic Interface 2 (MDI 2). Install EL-52100 (MDI 2) using wired USB Connection from MDI 2 to computer and verify it is working properly. Using the EL-47955 (MDI) will result in a programming failure.
3. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12V system during SPS programming events.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.

Note: If unable to power mode vehicle for Brake Pedal Position Learn procedure during programming process, the driver door must be opened/closed continuously until the vehicle enters power mode.

5. On the SPS Supported Controllers screen, select K9 Body Control Module - Programming and follow the on-screen instructions.
6. Place the keyless entry transmitter in the programming pocket prior to proceeding with the next step. All additional transmitters must be at least 3 m (9.8 ft) away from the vehicle. Refer to the Remote Keyless Entry (RKE) System Operation document in the owner manual for the exact pocket location. This document is located in the Keys, Doors, and Windows > Keys and Locks category.

Note:

- To prevent errors or immobilizer learn failure, the vehicle must be in Park (for automatic transmission) or Neutral with park brake applied (for manual transmission).
- If DTC B1987 set immediately after programming a replacement K9 Body Control Module, the Immobilizer Learn procedure was not properly completed. The Immobilizer Learn procedure needs to be performed again.
- The Immobilizer Learn process may take between 10-12 min and progress will appear to have stopped during this process. This is a normal security timer response and a restart should not be performed.

7. On the SPS Supported Controllers screen, select Z1 Immobilizer Learn. On the next screen, select Body Control Module IMMO Learn with Existing Transponder or Remote Key and follow the on-screen instructions. When Immobilizer Learn is complete, press the Unlock button on the keyless entry transmitter to allow the keyless entry transmitter to exit the Immobilizer Learn mode.

Note:

- When performing the Tire Pressure Monitor Sensor Learn during K9 Body Control Module setup, the *EL-52545*
  Tire Pressure Monitor Sensor and RF Diagnostic Tool must be used to activate each tire pressure sensor.

- If the Setup step fails and DTC U1962 is set in the K9 Body Control Module, perform the Serial Data Authentication Configuration procedure and then repeat the Setup step again. Refer to: *Serial Data Authentication Configuration 3-49*.

8. On the SPS Supported Controllers screen, select K9 Body Control Module - Setup and follow the on-screen instructions.
9. Check the driver information center display for additional messages regarding further calibration instructions. If there are no additional driver information center instructions present, programming is complete.
10. Clear DTCs.

Programming an Existing Control Module

To program an existing K9 Body Control Module, perform the following procedure:

Note:

- Verify all control modules are connected and communicating before attempting to program the control module.
- Begin with the vehicle in vehicle OFF power mode. The Service Programming System will power mode the vehicle.

1. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
2. Disconnect Wi-Fi dongle if it is currently connected to *EL-52100* Multiple Diagnostic Interface 2 (MDI 2). Install EL-52100 (MDI 2) using wired USB Connection from MDI 2 to computer and verify it is working properly. Using the EL-47955 (MDI) will result in a programming failure.
3. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12V system during SPS programming events.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select K9 Body Control Module - Programming and follow the on-screen instructions.
6. Check the driver information center display for additional messages regarding further calibration instructions. If there are no additional driver information center instructions present, programming is complete.
7. Clear DTCs.

Unsuccessful Programming Recovery

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming System (SPS) and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the K9 Body Control Module.
   All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This can vary depending on vehicle and control module location and can be done by one of the options listed below:
   - Removing all fuses supplying battery voltage and ignition voltage to the control module.
   - Disconnecting all harness connectors from the control module.
   - Performing a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .
3. Reconnect all battery voltage and ignition voltage sources to the K9 Body Control Module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the K9 Body Control Module, X84 Data Link Connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the K9 Body Control Module.
8. Verify the K9 Body Control Module can be programmed.

⇒ **If the K9 Body Control Module can not be programmed**

   8.1. Ignition ON/Vehicle in Service Mode for 1 min.

   8.2. Ignition/Vehicle OFF.

8.3. Access SPS and follow the on-screen instructions for the K9 Body Control Module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.
- For optimal consistency during the reprogramming session, we recommend connecting the computer/ laptop to a hardwired Ethernet cable, as the large software file size may affect stability.

8.4. Verify the K9 Body Control Module can be programmed.

⇒ If the K9 Body Control Module can not be programmed, replace the K9 Body Control Module.

⇓ If the K9 Body Control Module can be programmed

8.5. Clear DTCs.

⇓ **If the K9 Body Control Module can be programmed**

9. Clear DTCs.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: *Diagnostic Repair Verification 3-319*.

For control module replacement, programming, and setup, refer to: *Control Module References 3-4*.

K17 Electronic Brake Control Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module

To program a replacement or an existing control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K17 Electronic Brake Control Module - Prepare Control Module for Removal and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K17 Electronic Brake Control Module - Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select K17 Electronic Brake Control Module - Configuration and Setup while following the on-screen instructions.
5. Clear DTCs

Reprogram Control Module

To reprogram an existing control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K17 Electronic Brake Control Module - Programming and follow the on-screen instructions.
3. Clear DTCs

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

2.1. Ignition OFF for one minute, ignition ON.

2.2. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

2.3. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the _Diagnostic Repair Verification 3-319_ after completing the repair.

Control Module References 3-4 for Control Module replacement, programming and setup

K20 Engine Control Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector (DLC). If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to Incomplete.
- Note the engine oil life remaining percentage.
- If over 14k GVW, program the engine serial number with the scan tool.
- If unable to complete programming or have questions contact Techlline 1–800–828–6860

Replace and Program Control Module

Note:

- The Prepare Control Module for Removal function can only be performed when communication with the old control module is still possible.
- Instances may occur where data is not transferred during the Prepare Control Module for Removal Function

1. Ignition » On / Vehicle » In Service Mode
2. Perform the scan tool function: Create Report
   - Air Cleaner Life Remaining— If equipped
   - Engine Oil Life Remaining
   - Fuel Filter Life Remaining— If applicable
   - Fuel Injector Flow Characteristic Identification — If applicable
3. Access the Service Programming System and follow the on-screen instructions for the control module: K20 Engine Control Module
4. Select— Prepare Control Module for Removal— If applicable
5. Ignition/Vehicle & All vehicle systems » Off
6. Replace the component: K20 Engine Control Module
7. Ignition » On / Vehicle » In Service Mode

Note:

- If both controller options below are listed, select K20 Engine and K71 Transmission Control Modules.
- Refer to: _Control Module References 3-4_— K71 Control Module Programing
- If the programming is not successful Refer to: _Control Module References 3-4_— K56 Control Module Programing

8. Perform the SPS function:
   - K20 Engine and K71 Transmission Control Modules — Follow the on-screen instructions.
   - K20 Engine Control Module— Follow the on-screen instructions.
9. Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to No.
10. Perform the SPS function: Immobilizer Learn— If equipped .

    Refer to: [Link target (target-id 158692-) not found]

Note: If both controller options below are listed, select K20 Engine Control Module.

11. Perform the SPS function: K20 Engine Control ModuleSetup— Configuration

    Perform any adjustment, programming or setup procedures that are required when a component or module is removed or replaced. Follow the on-screen instructions.

12. Perform the scan tool learn/reset function:
    - Air Cleaner Monitor Setup— If equipped
    - Barometric Pressure Sensor Reset— If equipped
    - Engine Oil Life Remaining
    - Fuel Filter Life Remaining— If applicable
    - Fuel Pressure Regulator Learn— If applicable
    - Fuel Rail Pressure Relief Valve Learned Values Reset— If applicable
    - Fuel Injector Flow Characteristic Identification — If equipped
    - Intake System Learned Values Reset— If equipped
    - Throttle Body Idle Air Flow Compensation Reset
    - Turbocharger Wastegate Learn— If equipped
    - Turbocharger/Supercharger Boost Control Initial Position Learn— If applicable
13. Perform the scan tool function: Clear DTCs
14. Ignition/Vehicle & All vehicle systems » Off
15. Ignition » On / Vehicle » In Service Mode
16. Select: K71 Transmission Control Module
17. Perform the scan tool configuration/reset function: Transmission Service Fast Learn— If available
18. Perform the scan tool function: Clear DTCs
19. Ignition/Vehicle & All vehicle systems » Off
20. Operate the vehicle within the conditions of the customer's concern.

Reprogram Control Module

1. Access the Service Programming System and follow the on-screen instructions for the control module: K20 Engine Control Module
2. Ignition » On / Vehicle » In Service Mode

Note:

- If both controller options below are listed, select K20 Engine and K71 Transmission Control Modules.
- Refer to: _Control Module References 3-4_— K71 Control Module Programing

3. Perform the SPS function:
    - K20 Engine and K71 Transmission Control Modules — Follow the on-screen instructions.
    - K20 Engine Control Module— Follow the on-screen instructions.
4. Perform the scan tool function: Clear DTCs
5. Perform the scan tool learn/reset function:
    - Barometric Pressure Sensor Reset— If equipped
    - Fuel Pressure Regulator Learn— If equipped
    - Fuel Rail Pressure Relief Valve Learned Values Reset— If equipped
    - Intake System Learned Values Reset— If equipped
    - Throttle Body Idle Air Flow Compensation Reset
    - Turbocharger Wastegate Learn— If equipped
    - Turbocharger/Supercharger Boost Control Initial Position Learn— If equipped
6. Perform the scan tool function: Clear DTCs
7. Ignition/Vehicle & All vehicle systems » Off
8. Ignition » On / Vehicle » In Service Mode
9. Select: K71 Transmission Control Module
10. Perform the scan tool configuration/reset function: Transmission Service Fast Learn— If available
11. Perform the scan tool function: Clear DTCs
12. Ignition/Vehicle & All vehicle systems » Off
13. Operate the vehicle within the conditions of the customer's concern.

Unsuccessful Programming Recovery

If programming a control module is not successful, perform the following procedure:

1. Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.
2. Ignition » On / Vehicle » In Service Mode
3. Access the Service Programming System and follow the on-screen instructions for the control module: K20 Engine Control Module

Note: If both controller options below are listed, select K20 Engine and K71 Transmission Control Modules.

4. Perform the SPS function:
    - K20 Engine and K71 Transmission Control Modules — Follow the on-screen instructions.
    - K20 Engine Control Module— Follow the on-screen instructions.
5. Perform the scan tool function: Clear DTCs
6. Ignition/Vehicle » Off — For greater than 1 min
7. Ignition » On / Vehicle » In Service Mode
8. Verify the control module programming is successful.

⇒ **If the programming is not successful**

8.1. Ignition/Vehicle » Off — For greater than 1 min

8.2. Ignition » On / Vehicle » In Service Mode

Note: If both controller options below are listed, select K20 Engine and K71 Transmission Control Modules.

8.3. Perform the SPS function:

        - K20 Engine and K71 Transmission Control Modules — Follow the on-screen instructions.
        - K20 Engine Control Module— Follow the on-screen instructions.

⇒ If the programming is not successful Replace the appropriate component: K20 Engine Control Module orK71 Transmission Control Module

⇓ If the programming is successful

8.4. All OK.

⇓ **If the programming is successful**

9. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming and setup.

K29FV Front Seat Heater Vent Control Module: Programming and Setup

This device does not require programming or setup.

K36 Restraints Control Module: Programming and Setup

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle 3-255* prior to using this diagnostic procedure.
- Review the description of *Strategy Based Diagnosis 3-245*

Note:
- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicle's battery such as interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- Programming must begin with the Ignition/Vehicle OFF. Programming will direct the appropriate control module(s) to change power mode as needed during the procedure, independent of the vehicle’s power mode.
- To prevent programming failure due to unintended wireless drops, it is recommended that a wired MDI 2 connection be used when programming the control module.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.

Reference Information

Special Tools
EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

Programming an Existing or New Control Module

To program an existing or new control module, perform the following procedure:

Note:
- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle and verify it is working properly. Using the EL-47955 (MDI) will result in a programming failure.
- Verify all control modules are connected and communicating before attempting to program the K36 Restraints Control Module.
- Verify the key fob is inside the vehicle. If the key fob is not inside the vehicle, the serial data authentication configuration procedure which runs automatically at the end of the programming step will fail even though the programming appears to run successfully. If the serial data authentication configuration procedure fails, DTC U1962 will set and/or the setup step will fail or be incomplete.

1. Place the vehicle on level ground (the vehicle must be level or the IMU setup may fail)
2. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
3. Access the Service Programming System (SPS) and follow the on-screen instructions for the K36 Restraints Control Module.
4. Perform the SPS function: **Programming** and follow the on-screen instructions.
5. Perform the SPS function: **Setup** and follow the on-screen instructions.
6. Clear DTCs.

Unsuccessful Programming Recovery

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module. Refer to [Link target (target-id 300812-) not found] to diagnose these Ethernet circuits.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming System (SPS) and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the control module.

Note: All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This can vary depending on vehicle and control module location and can be done by one of the options listed below:

- Removing all fuses supplying battery voltage and ignition voltage to the control module.
- Disconnecting all harness connectors from the control module.
- Performing a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .

3. Reconnect all battery voltage and ignition voltage sources to the control module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the control module, data link connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the control module.
8. Verify the control module can be programmed.

⇒ **If the control module can not be programmed**

8.1. Ignition ON/Vehicle in Service Mode for 1 min.

8.2. Ignition/Vehicle OFF.

8.3. Access SPS and follow the on-screen instructions for the control module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.

8.4. Verify the control module can be programmed.

⇒ If the control module can not be programmed, replace the control module.

⇓ If the control module can be programmed

8.5. Clear DTCs.

⇓ **If the control module can be programmed**

9. Clear DTCs.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming, and setup.

K38A Chassis Control Module - Auxiliary: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected form the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.

- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K38A Chassis Control Module-Auxiliary - Programming and follow the on-screen instructions.
3. Clear DTCs.
4. With a scan tool, perform the Suspension Sensor Trim Height Calibration, if applicable.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

   2.1. Ignition OFF for one minute, ignition ON.

   2.2. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

   2.3. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming and setup.

K40D Driver Seat Adjuster Memory Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K40D Driver Seat Adjuster Memory Module - Programming and follow the on-screen instructions.
3. Clear DTCs.
4. Move the seat to a central, middle range position, then perform the memory store operation for memory “1”, “2”, and “Exit” or “3” if equipped. Refer to the Owner Manual for storing memory seat positions.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

   2.1. Disconnect the battery.

   2.2. Wait 1 minute, reconnect the battery.

2.3. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

2.4. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification 3-319 after completing the repair.

Control Module References 3-4 for Control Module replacement, programming and setup

K40P Passenger Seat Adjuster Memory Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K40P Passenger Seat Adjuster Memory Module - Programming and follow the on-screen instructions.
3. Clear DTCs.
4. Move the seat to a central, middle range position, then perform the memory store operation for memory “1”, “2”, and “Exit” or “3” if equipped. Refer to the Owner Manual for storing memory seat positions.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

2.1. Disconnect the battery.

2.2. Wait 1 minute, reconnect the battery.

2.3. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

2.4. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification 3-319 after completing the repair.

Control Module References 3-4 for Control Module replacement, programming and setup

K43 Power Steering Control Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption

during programming, programming failure or control module damage may occur.

- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module

To program a replacement power steering control module, perform the following procedure:

1. Ignition OFF.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K43 Power Steering Control Module - Programming and follow the on-screen instructions.
4. Clear DTCs.
5. On the SPS Supported Controllers screen, select K43 Power Steering Control Module - Setup and follow the on-screen instructions.
6. Clear DTCs.

Reprogram Control Module

To program an existing power steering control module, perform the following procedure:

1. Ignition OFF.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K43 Power Steering Control Module - Programming and follow the on-screen instructions.
4. Clear DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition OFF. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

  2.1. Ignition OFF for one minute, ignition ON.
  2.2. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

  2.3. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming and setup.

K44 Power Take-off Control Module: Programming and Setup

Copy and Restore

Copy:
When replacing the Power Take-Off module (PTOM) prior to disconnecting any electrical connections it is recommended that the Copy portion of the PTOM Copy and Restore procedure is run using the GDS2 Scan Tool. This application is available under Module Diagnostics>(K44) Power Take-Off Module>Configuration/Reset Functions>PTO Operation Mode>Copy and Restore. Follow the steps for copying the PTO settings. Once the Copy function is complete the PTOM can now be disconnected and replaced.

Restore:
Once the PTOM has been replaced and all electrical connections have been made, the Restore portion of the procedure can be performed. This portion restores any settings that may have been set in the removed PTO module and may have been unique for the vehicle’s usage and/or application.

Note:
If communications by GDS2 with the to be replaced PTO module cannot be established, the settings, beyond the factory defaults, will need to be reconfigured to the customers requirements for proper PTO operation. This may be accomplished as noted in the Module Setup section below.

Programming

The power take-off module (PTOM) requires no programming or setup. When the PTOM is replaced, all programmable parameters will be defaulted back to factory settings.

Module Setup

The power take-off module requires that several parameters be setup according to customer requirements. Refer to the table below for available parameters and recommended setting. Refer to the GM Upfitter Integration website, <www.gmupfitter.com>, for the latest Power Take Off (PTO) Operating Description and Application Guide bulletin, which has extensive information about the power take-off system.

Note: When programming the PTO control module be sure to verify the ECM PTO options (stationary, variable or mobile) are synchronized with the PTOM. Example, if the PTOM is set to stationary mode then the ECM must also be set to stationary mode. If the two modules are not synchronized no PTO idle up will occur. The critical parameters are listed below:

- Remote engine shutdown
- Maximum PTO engine speed

Power Take-Off Module Programmable Parameters

Parameter	Available In Mode			Factory Default Setting
	Stationary Preset	Stationary Variable	Mobile	
PTO Mode	X	X	X	Preset
PTO In-Cab Control	Y	Y	Y	Enabled
PTO Remote Control	Y	Y	N	Disabled
Type Of (Exterior) Set Switch Operation	Y	Y	N	Momentary
Press “ON” Then Go To Preset 1 Speed	Y	N	N	Disabled
PTO Standby RPM	Y	Y	Y	850 RPM
PTO Preset 1 Speed	Y	Y	Y	1250 RPM
PTO Preset 2 Speed	Y	Y	Y	1700 RPM
Maximum PTO Operating Speed	Y	Y	Y	2100 RPM
Tap Step	N	Y	Y	100 RPM
Ramp Rate	Y	Y	Y	200 RPM/Sec
Maximum Vehicle Speed	N	N	Y	129 KPH (80 MPH)
Minimum Remote Accelerator Voltage	Y	Y	N	0.25 V
Maximum Remote Accelerator Voltage	Y	Y	N	4.75 V
Action When Remote Set Switch Transitions To Low Voltage (<1.66 V)	Y	N	N	Go to Set Speed 1
Remote Set Switch Transition To Open State (Between >1.66 V And <3.33 V)	Y	N	N	Go to Standby Speed
Remote Set Switch Transition To High Voltage (>3.33 V)	Y	N	N	Go to Set Speed 2
Remote Engine Start	Y	Y	N	Disabled
Remote Engine Shutdown	Y	Y	N	Disabled
Load Feedback	Y	Y	Y	Disabled

Parameter	Available In Mode			Factory Default Setting
	Stationary Preset	Stationary Variable	Mobile	
Engage Relay	Y	Y	Y	Disabled
Keep Relay Engaged During Braking	N	N	Y	Disabled
Action After Brake Is Released	N	N	Y	RETURN TO BASE IDLE RPM
Auto Engine Shutdown Timer	Y	Y	N	Disabled
Engine Shutdown Due To Critical Engine Condition	Y	Y	N	Disabled
Engine Shutdown Warning	Y	Y	N	Disabled
Set Low Fuel Level For Engine	Y	Y	N	Disabled
Maximum PTO Engine Speed	Y	Y	Y	1800 RPM
Maximum PTO Engage Speed	Y	Y	Y	1500 RPM

Recommended Settings For PTOM Parameters

Programmable Parameter	Preset	Variable	Mobile	Range	Notes
PTO Mode	Default	Available	Available	—	—
PTO In-Cab Control	Enable/Disable	Enable/Disable	Enable/Disable	—	—
PTO Remote Control	Enable/Disable	Enable/Disable	Enable/Disable	—	—
Type Of (Exterior) Set Switch Operation	Momentary/ Latching	Momentary/ Latching	Momentary/ Latching	—	—
Press “ON” Then Go to Preset 1 Speed	Disabled	Enable/Disable	N/A	N/A	In cab ON switch. Remote enable after arming.
PTO Standby RPM	Within Range	Within Range	Within Range	Base Idle-3100 RPM	Base idle overrides if higher.
PTO Preset 1 Speed	Within Range	RPM Capture Or Tap Down	RPM Capture Or Tap Down	Above Standby–3100 RPM	Set (-) switch internal. Set switch external-disabled in mobile. Both can be enabled simultaneously.
PTO Preset 2 Speed	Within Range	Resume Or Tap Up	Resume Or Tap Up	Above Standby–3100 RPM	Set (+) switch internal. Set switch external-disabled in mobile. Both can be enabled simultaneously.
Maximum PTO Operating Speed	Within Range	Within Range	Within Range	Base Idle-3100 RPM	—
Tap Step	Within Range	Within Range	Within Range	4–500 RPM	—

Programmable Parameter	Preset	Variable	Mobile	Range	Notes
Ramp Rate	Within Range	Within Range	Within Range	4–1000 RPM/ Second	Setting applies to remote switch inputs and remote throttle (Potentiometer) inputs.
Maximum Vehicle Speed	N/A	N/A	Within Range	30 KPH (19 MPH) to 129 KPH (80 MPH)	Applies to mobile only.
Minimum Remote Accelerator Voltage	N/A	Within Range	N/A	0–2.5 V	Remote throttle must be enabled for parameter to apply.
Maximum Remote Accelerator Voltage	N/A	Within Range	N/A	2.5–5.0 V	Remote throttle must be enabled for parameter to apply.
Action When Remote Set Switch Transitions To Low Voltage (<1.66 V)	See Range	N/A	N/A	Go To Standby, Set 1 Or Set 2	Defines PTO system action when remote set switch input goes low.
Remote Set Switch Transition To Open State (Between >1.66 V And <3.33 V)	See Range	N/A	N/A	Go To Standby, Set 1 Or Set 2	Defines PTO system action when remote set switch input goes to open state.
Remote Set Switch Transition To High Voltage (>3.33 V)	See Range	N/A	N/A	Go To Standby, Set 1 Or Set 2	Defines PTO system action when remote set switch input goes to +5 V reference.
Remote Engine Start	Enable/Disable	Enable/Disable	N/A	—	Requires remote switches.
Remote Engine Shutdown	Enable/Disable	Enable/Disable	N/A	—	Requires remote Switches.
Load Feedback	Enable/Disable	Enable/Disable	Enable/Disable	—	Requires remote wiring.
Engage Relay	Enable/Disable	Enable/Disable	Enable/Disable	—	Requires remote relay.
Keep Relay Engaged During Braking	N/A	N/A	Enable/Disable	—	—
Action After Brake Is Released	N/A	N/A	Return to base idle RPM — Return to standby RPM	—	—
Auto Engine Shutdown Timer	Enable/Disable	Enable/Disable	N/A	4 minutes — 7 hours	—
Engine Shutdown Due To Critical Engine Condition	Enable/Disable	Enable/Disable	N/A	—	Oil Pressure, Hot Engine, Hot Transmission, Low Oil, Low Fuel, Diesel Particulate Filter Regeneration Required

Programmable Parameter	Preset	Variable	Mobile	Range	Notes
Engine Shutdown Warning	Enable/Disable	Enable/Disable	N/A	7 minutes	If PTO operation is continued when critical engine conditions are present, a horn chirp warning will occur after 2 to 5 minutes. The engine will be shutdown 2 minutes after the horn warning.
Set Low Fuel Level For Engine	N/A	Enable/Disable	N/A	15–25 % Fuel Level	—
Maximum PTO Engine Speed	Within Range	Within Range	Within Range	950–3100 RPM	—
Maximum PTO Engage Speed	—	—	—	Base Idle-1800 RPM	—

K56 Serial Data Gateway Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicle's battery such as interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- Programming must begin with the Ignition/Vehicle OFF. Programming will direct the appropriate control module(s) to change power mode as needed during the procedure, independent of the vehicle’s power mode.
- To prevent programming failure due to unintended wireless drops, it is recommended that a wired MDI 2 connection be used when programming the control module.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to No.

Reference Information

Special Tools

EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

Programming a New Control Module

To program a replacement K56 Serial Data Gateway Module, perform the following procedure:

Note:

- Verify all control modules are connected and communicating before attempting to program the K56 Serial Data Gateway Module.
- Verify the key fob is inside the vehicle. If the key fob is not inside the vehicle, the serial data authentication configuration procedure which runs automatically at the end of the programming step will fail even though the programming appears to run successfully. If the serial data authentication configuration procedure fails, DTC U1962 will set and/or the setup step will fail or be incomplete.
- Begin with the vehicle in vehicle OFF power mode. The Service Programming System will power mode the vehicle.

1. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
2. Disconnect Wi-Fi dongle if it is currently connected to *EL-52100* Multiple Diagnostic Interface 2 (MDI 2). Install EL-52100 (MDI 2) using wired USB Connection from MDI 2 to computer and verify it is working properly. Using the EL-47955 (MDI) will result in a programming failure.

3. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12V system during SPS programming events.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select K56 Serial Data Gateway Module - Programming and follow the on-screen instructions.

Note: If the Setup step fails and DTC U1962 is set in the K56 Serial Data Gateway Module, perform the Serial Data Authentication Configuration procedure and then repeat the Setup step again. Refer to: *Serial Data Authentication Configuration 3-49*.

6. On the SPS Supported Controllers screen, select K56 Serial Data Gateway Module - Setup and follow the on-screen instructions.

Note: If an error message indicates that a module is missing after the Setup procedure is complete, diagnose that module to make sure that it’s connected and communicating and then perform the Programming and Setup procedures again.

7. Clear DTCs.

Programming an Existing Control Module

To program an existing K56 Serial Data Gateway Module, perform the following procedure:

Note:
- Verify all control modules are connected and communicating before attempting to program the K56 Serial Data Gateway Module.
- Begin with the vehicle in vehicle OFF power mode. The Service Programming System will power mode the vehicle.

1. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
2. Disconnect Wi-Fi dongle if it is currently connected to *EL-52100* Multiple Diagnostic Interface 2 (MDI 2). Install EL-52100 (MDI 2) using wired USB Connection from MDI 2 to computer and verify it is working properly. Using the EL-47955 (MDI) will result in a programming failure.
3. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12V system during SPS programming events.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select K56 Serial Data Gateway Module - Programming and follow the on-screen instructions.
6. Clear DTCs.

Unsuccessful Programming Recovery

Note:
- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module. Refer to [Link target (target-id 300812-) not found] to diagnose these Ethernet circuits.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming System (SPS) and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the K56 Serial Data Gateway Module. All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This can vary depending on vehicle and control module location and can be done by one of the options listed below:
   - Removing all fuses supplying battery voltage and ignition voltage to the control module.
   - Disconnecting all harness connectors from the control module.
   - Performing a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .
3. Reconnect all battery voltage and ignition voltage sources to the K56 Serial Data Gateway Module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the K56 Serial Data Gateway Module, X84 Data Link Connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the K56 Serial Data Gateway Module.
8. Verify the K56 Serial Data Gateway Module can be programmed.

⇒ **If the K56 Serial Data Gateway Module can not be programmed**

  8.1. Ignition ON/Vehicle in Service Mode for 1 min.

  8.2. Ignition/Vehicle OFF.

  8.3. Access SPS and follow the on-screen instructions for the K56 Serial Data Gateway Module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.

  8.4. Verify the K56 Serial Data Gateway Module can be programmed.

⇒ If the K56 Serial Data Gateway Module can not be programmed, replace the K56 Serial Data Gateway Module.

⇓ If the K56 Serial Data Gateway Module can be programmed

  8.5. Clear DTCs.

⇓ **If the K56 Serial Data Gateway Module can be programmed**

9. Clear DTCs.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: *Diagnostic Repair Verification 3-319*.

For control module replacement, programming, and setup, refer to: *Control Module References 3-4*.

K56U Special Purpose Vehicle Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected form the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control module, Refer to*https://www.gmupfitter.com/*Then proceed to the following procedures:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K56U Special Vehicle Purpose Module - Programming and follow the on-screen instructions.
3. Clear DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

  2.1. Ignition OFF for one minute, ignition ON.

  2.2. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

  2.3. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming and setup.

K60 Column Lock Module: Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the control module is not properly configured with the correct calibration software, the control module will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program Column Lock Control Module

To program a replacement column lock control module, perform the following procedure:

Note: Before reprogramming, to ensure that the column lock password from the BCM is learned: turn ignition ON and then OFF, close all doors, and wait 5 minutes.

1. Ignition ON.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. If available, on the SPS Supported Controllers screen, select K60 Column Lock Control Module – Prepare Control Module For Removal and follow the on-screen instructions.

Note: The Prepare Control Module for Removal function can only be performed when communication with the old control module is still possible

4. Replace the Column Lock Module. Refer to: *Control Module References 3-4*
5. Ignition ON for 10 seconds, ignition OFF.
6. Close all doors and wait 5 minutes.
7. Ignition ON.
8. On the SPS Supported Controllers screen, select K60 Column Lock Control Module – Programming and follow the on-screen instructions.
9. Clear DTCs.

Reprogram Column Lock Control Module

Note: Before reprogramming, to ensure that the steering column lock password from the BCM is learned: turn ignition ON and then OFF, close all doors, and wait 5 minutes.

To reprogram an existing column lock control module, perform the following procedure:

1. Ignition ON for 10 seconds, ignition OFF.
2. Close all doors and wait 5 minutes.
3. Ignition ON.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select K60 Column Lock Control Module – Programming and follow the on-screen instructions.
6. Clear DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

   2.1. Ignition OFF for one minute, ignition ON.
   2.2. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

   2.3. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming and setup

K61 Sunroof Control Module: Programming and Setup

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle 3-255* prior to using this diagnostic procedure.
- Review the description of *Strategy Based Diagnosis 3-245*

Note:
- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicle's battery such as interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- Programming must begin with the Ignition/Vehicle OFF. Programming will direct the appropriate control module(s) to change power mode as needed during the procedure, independent of the vehicle’s power mode.
- To prevent programming failure due to unintended wireless drops, it is recommended that a wired MDI 2 connection be used when programming the control module.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.

Reference Information

Special Tools
EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

Programming an Existing or New Control Module

This control module does not require SPS programming or any setup procedures.

Please refer to: [Link target (target-id 130156-) not found] for programming and setup.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming, and setup.

K67 Trailer Brake Control Module: Programming and Setup

Replace and Program ECU or Reprogram ECU

This ECU does not require SPS programming or any setup procedures.

K68 Trailer Lighting Control Module: Programming and Setup

The K68 Trailer Lamp Control Module does not require programming, but does require serial data authentication. Refer to: *Serial Data Authentication Configuration 3-49*.

K69 Transfer Case Control Module: Programming and Setup (NQF)

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: *Diagnostic System Check - Vehicle 3-255*
- Review the description of Strategy Based Diagnosis: *Strategy Based Diagnosis 3-245*

Note:
- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or

booster pack disconnected from the AC voltage supply.

- Turn Off or disable systems that may put a load on the vehicle's battery. For example, interior lights, daytime running lights, HVAC, and radio.
- During the programming procedure, follow the Service Programming System (SPS) prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.

Programming an Existing or New Control Module

To program an existing or new control module, perform the following procedure:

1. Ignition » On / Vehicle » In Service Mode
2. Access SPS and follow the on-screen instructions for the control module: K69 Transfer Case Control Module
3. Perform the SPS function: K69 Transfer Case Control Module — Programming
4. Perform the SPS function: K69 Transfer Case Control Module — Setup
5. Clear DTCs.
6. Perform the scan tool Transfer Case Range Actuator Dual End Stop Learn.

   Refer to: [Link target (target-id 319950-) not found]

Unsuccessful Programming Recovery

If programming a control module is not successful, perform the following procedure:

1. Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.
2. Ignition » On / Vehicle » In Service Mode
3. Perform the SPS function: K69 Transfer Case Control Module — Programming

   Verify the control module programming is successful.

⇒ **If the programming is not successful**

   3.1. Ignition/Vehicle » Off — For greater than 1 min

   3.2. Ignition » On / Vehicle » In Service Mode

   3.3. Perform the SPS function: K69 Transfer Case Control Module — Programming

⇒ If the programming is not successful » Replace the component: K69 Transfer Case Control Module

      3.3.1. Replace the component: K69 Transfer Case Control Module

      3.3.2. Perform the SPS function: K69 Transfer Case Control Module — Setup

⇓ If the programming is successful

   3.4. Perform the SPS function: K69 Transfer Case Control Module — Setup

⇒ If the procedure was not successful

      3.4.1. Replace the component: A16 Transfer Case Motor

      3.4.2. Perform the SPS function: K69 Transfer Case Control Module — Setup

⇓ If the procedure was successful

   3.5. Perform the scan tool Transfer Case Range Actuator Dual End Stop Learn.

   Refer to: [Link target (target-id 319950-) not found]

   3.6. All OK.

⇓ **If the programming is successful**

4. Perform the SPS function: K69 Transfer Case Control Module — Setup
5. Clear DTCs.
6. Perform the scan tool Transfer Case Range Actuator Dual End Stop Learn.

   Refer to: [Link target (target-id 319950-) not found]
7. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: *Diagnostic Repair Verification 3-319*

For control module replacement, programming, and setup refer to: *Control Module References 3-4*

K69 Transfer Case Control Module: Programming and Setup (NQH)

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: *Diagnostic System Check - Vehicle 3-255*
- Review the description of Strategy Based Diagnosis: *Strategy Based Diagnosis 3-245*

Note:

- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.

- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn Off or disable systems that may put a load on the vehicle's battery. For example, interior lights, daytime running lights, HVAC, and radio.
- During the programming procedure, follow the Service Programming System (SPS) prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to No.

Programming an Existing Control Module

1. Ignition » On / Vehicle » In Service Mode
2. Access SPS and follow the on-screen instructions for the control module: K69 Transfer Case Control Module
3. Perform the SPS function: K69 Transfer Case Control Module — Prepare Control Module for Removal
4. Perform the SPS function: K69 Transfer Case Control Module — Programming
5. Perform the SPS function: K69 Transfer Case Control Module — Setup

   Verify the Transfer Case Clutch Identifieris auto populated correctly, if incorrect enter the correct Transfer Case Clutch Identifier.

   Refer to: [Link target (target-id 163394-) not found]
6. Clear DTCs.
7. Perform the scan tool Transfer Case Range Actuator Learn.

   Refer to: [Link target (target-id 319036-) not found]

Programming a New Control Module — Old Module Communicates

1. Ignition » On / Vehicle » In Service Mode
2. Access SPS and follow the on-screen instructions for the control module: K69 Transfer Case Control Module
3. Perform the SPS function: K69 Transfer Case Control Module — Prepare Control Module for Removal
4. Replace the component: K69 Transfer Case Control Module
5. Perform the SPS function: K69 Transfer Case Control Module — Programming
6. Perform the SPS function: K69 Transfer Case Control Module — Setup

   Verify the Transfer Case Clutch Identifieris auto populated correctly, if incorrect enter the correct Transfer Case Clutch Identifier.

   Refer to: [Link target (target-id 163394-) not found]
7. Clear DTCs.
8. Perform the scan tool Transfer Case Range Actuator Learn.

   Refer to: [Link target (target-id 319036-) not found]

Programming a New Control Module — Old Module Does Not Communicate

1. Replace the component: K69 Transfer Case Control Module
2. Ignition » On / Vehicle » In Service Mode
3. Access SPS and follow the on-screen instructions for the control module: K69 Transfer Case Control Module
4. Perform the SPS function: K69 Transfer Case Control Module — Programming
5. Perform the SPS function: K69 Transfer Case Control Module — Setup

   Enter the Transfer Case Clutch Identifier

   Refer to: [Link target (target-id 163394-) not found]
6. Clear DTCs.
7. Perform the scan tool Transfer Case Range Actuator Learn.

   Refer to: [Link target (target-id 319036-) not found]

Unsuccessful Programming Recovery

If programming a control module is not successful, perform the following procedure:

1. Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.
2. Ignition » On / Vehicle » In Service Mode
3. Perform the SPS function: K69 Transfer Case Control Module — Programming

   Verify the control module programming is successful.

⇒ **If the programming is not successful**

   3.1. Ignition/Vehicle » Off — For greater than 1 min
   3.2. Ignition » On / Vehicle » In Service Mode

3.3. Perform the SPS function: K69 Transfer Case Control Module — Programming

⇒ If the programming is not successful » Replace the component: K69 Transfer Case Control Module

⇓ If the programming is successful

3.4. Perform the SPS function: K69 Transfer Case Control Module — Setup

Enter the Transfer Case Clutch Identifier

3.5. Clear DTCs.

3.6. Perform the scan tool Transfer Case Range Actuator Learn.

Refer to: [Link target (target-id 319036-) not found]

3.7. All OK.

⇓ **If the programming is successful**

4. Perform the SPS function: K69 Transfer Case Control Module — Setup
5. Clear DTCs.
6. Perform the scan tool Transfer Case Range Actuator Learn.

   Refer to: [Link target (target-id 319036-) not found]
7. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: *Diagnostic Repair Verification 3-319*

For control module replacement, programming, and setup refer to: *Control Module References 3-4*

K71 Transmission Control Module: Programming and Setup (10L1000 (MGM MGU, MKM))

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: *Diagnostic System Check - Vehicle 3-255*
- Review the description of Strategy Based Diagnosis: *Strategy Based Diagnosis 3-245*

Note:

- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn Off or disable systems that may put a load on the vehicle's battery. For example, interior lights, daytime running lights, HVAC, and radio.
- During the programming procedure, follow the Service Programming System (SPS) prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.

Programming an Existing or New Control Module

1. Ignition » On / Vehicle » In Service Mode

Note:

- If both controller options below are listed, select K20/K71 Engine and Transmission Control Modules.
- If the programming is not successful Refer to: *Control Module References 3-4*— K56 Control Module Programing

2. Perform the SPS function:
   - K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
   - K71 Transmission Control Module and follow on-screen instructions.

   2.1. Select» Programming

   2.2. Select» MCVM Operations— If applicable

   2.3. Ignition/Vehicle » Off — For greater than 2 min

   2.4. Select» Setup— Follow the on-screen instructions.
3. Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.
4. Perform the scan tool configuration/reset function: Transmission Service Fast Learn— If available
5. All OK.

Unsuccessful Programming Recovery

Note:

- If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.

1. Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.
2. Ignition » On / Vehicle » In Service Mode
3. Perform one of the following SPS Programming functions:

Note: If both controller options below are listed, select K20/K71 Engine and Transmission Control Modules.

  - K20/K71 Engine and Transmission Control Modules and follow the on-screen instructions.
  - K71 Transmission Control Module and follow on-screen instructions.

4. Verify the control module programming is successful.

⇒ If the programming is not successful » Replace the component: K71 Transmission Control Module

⇓ If the programming is successful

  4.1. Select» MCVM Operations— If applicable

  4.2. Ignition/Vehicle » Off — For greater than 2 min

  4.3. Select» Setup— Follow the on-screen instructions.

  If setup is not an available option — Perform the appropriate learn/reset procedure with the scan tool

⇓ **If the programming is successful**

5. Select» MCVM Operations— If applicable
6. Ignition/Vehicle » Off — For greater than 2 min
7. Select» Setup— Follow the on-screen instructions.

   If setup is not an available option — Perform the appropriate learn/reset procedure with the scan tool
8. Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.
9. Perform the scan tool configuration/reset function: Transmission Service Fast Learn— If available
10. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: *Diagnostic Repair Verification 3-319*

For control module replacement, programming, and setup refer to: *Control Module References 3-4*

K73 Telematic Control Module: Programming and Setup

Note:

- DO NOT reprogram a control module due to “UNKNOWN” displayed in “Current # “ on the programming screen. “UNKNOWN” will be displayed due to only a utility file being programmed and will not display a current part number.
- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- Programming must begin with the Ignition/Vehicle OFF. Programming will direct the appropriate control module(s) to change power mode as needed during the procedure, independent of the vehicle’s power mode.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Diagnostic Aids

- It is critical to use the service replacement K73 Telematic Control Module only in the vehicle for which it was ordered.
- Failure to perform the following procedures will result in a red LED, DTC(s) being set, and limited or incomplete OnStar® services.

- An OnStar® button press to the OnStar® call center is required to complete the module replacement procedure.
- To fully activate an OnStar® module, both the setup and activation request procedures must be completed on all vehicles with and without an active OnStar® subscription to insure the unit has been setup properly for the vehicle it has been installed into and also to update the OnStar® with the correct unit information.
- To initialize the Turn-by-Turn feature (if equipped), the vehicle must first be driven In open sky condition at speeds greater than 10 mph (16 kph) or more for a minimum of 5 miles (8 km), and perform at least 2 left and 2 right 90 degree turns coming to complete stops prior to each turn.
- On vehicles up fitted with TTY capabilities, it is necessary to perform a power cycle of the OnStar® Interface Module (OTIM) and toggle the TTY mode after completing the Communication Interface Module installation and setup procedures.

Reference Information

Special Tools

- EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

For equivalent regional tools, refer to *Special Tools 3-54*.

Replace and Program Control Module

To program a replacement control module, perform the following procedure:

Note: Begin with the vehicle in the vehicle OFF power mode. The Service Programming System will power mode the vehicle.

1. Ignition/Vehicle OFF
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. In the SPS Supported Controllers screen, select K73 Telematic Control Module Programming and Service Activation and follow the on-screen instructions.
4. Clear DTCs.
5. Inform the customer to press the OnStar® Blue Button to call OnStar® and inform the advisor the module has been replaced and the system needs to be activated if subscription is active.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

Note: Begin with the vehicle in the vehicle OFF power mode. The Service Programming System will power mode the vehicle.

1. Ignition/Vehicle OFF
2. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
3. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

3.1. Ignition OFF for one minute.

3.2. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

3.3. All OK.

⇓ **If the control module can be reprogrammed**

4. All OK.

K85P Restraints Occupant Classification System Module - Passenger: Programming and Setup

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle 3-255* prior to using this diagnostic procedure.
- Review the description of *Strategy Based Diagnosis 3-245*

Note:

- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.

- Turn OFF or disable systems that may put a load on the vehicle's battery such as interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- Programming must begin with the Ignition/Vehicle OFF. Programming will direct the appropriate control module(s) to change power mode as needed during the procedure, independent of the vehicle's power mode.
- To prevent programming failure due to unintended wireless drops, it is recommended that a wired MDI 2 connection be used when programming the control module.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to No.

Reference Information

Special Tools

EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

Programming an Existing or New Control Module

To program an existing or new control module, perform the following procedure:

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle and verify it is working properly. Using the EL-47955 (MDI) will result in a programming failure.
- Verify all control modules are connected and communicating before attempting to program the K85P Restraints Occupant Classification System Module.
- Verify the key fob is inside the vehicle. If the key fob is not inside the vehicle, the serial data authentication configuration procedure which runs automatically at the end of the programming step will fail even though the programming appears to run successfully. If the serial data authentication configuration procedure fails, DTC U1962 will set and/or the setup step will fail or be incomplete.
- Before ROCSM Programing and Setup can be conducted, the front passenger seat must be completely empty of all items. The presence of any liquid or items on the front passenger seat will affect the calibration and operation of the ROCSM.
- DTC U3000.99 will set if the re-zero system test is performed with:
  - An aftermarket seat heater located too close to the sensor mat
  - A scan tool, laptop or other electronic device is in the seat.
  - The seat is damp or wet
  - An object or person is in the seat

1. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
2. Verify that the temperature is between 32°F (0°C) to 100°F (38 °C).
3. Verify the seat is completely dry.
4. Empty the front outboard passenger seat.
5. Verify that all SIR and ROCSM components, connectors, and connector position assurances are properly connected and mounted.
6. Access the Service Programming System (SPS) and follow the on-screen instructions for the K85P Restraints Occupant Classification System Module.
7. Perform the SPS function: **Programming** and follow the on-screen instructions.
8. Perform the SPS function: **Setup** and follow the on-screen instructions.
9. Clear DTCs.

Unsuccessful Programming Recovery

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module. Refer to [Link target (target-id 300812-) not found] to diagnose these Ethernet circuits.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming System (SPS) and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the control module.

Note: All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This can vary depending on vehicle and control module location and can be done by one of the options listed below:

- Removing all fuses supplying battery voltage and ignition voltage to the control module.
- Disconnecting all harness connectors from the control module.
- Performing a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .

3. Reconnect all battery voltage and ignition voltage sources to the control module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the control module, data link connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the control module.
8. Verify the control module can be programmed.

⇒ **If the control module can not be programmed**

    8.1. Ignition ON/Vehicle in Service Mode for 1 min.
    8.2. Ignition/Vehicle OFF.
    8.3. Access SPS and follow the on-screen instructions for the control module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.

    8.4. Verify the control module can be programmed.

⇒ If the control module can not be programmed, replace the control module.

⇓ If the control module can be programmed

    8.5. Clear DTCs.

⇓ **If the control module can be programmed**

9. Clear DTCs.

Repair Instructions

For module replacement, refer to: [Link target (target-id 188211-) not found]

K115 Reductant Control Module: Programming and Setup

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: *Diagnostic System Check - Vehicle 3-255*
- Review the description of Strategy Based Diagnosis: *Strategy Based Diagnosis 3-245*

Note:

- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programming. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn Off or disable systems that may put a load on the vehicle's battery. For example, interior lights, daytime running lights, HVAC, and radio.
- During the programming procedure, follow the Service Programming System (SPS) prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to No.

Programming an Existing or New Control Module

To program an existing or new control module, perform the following procedure:

1. Ignition » On / Vehicle » In Service Mode
2. Access SPS and follow the on-screen instructions for the control module: K115 Reductant Control Module

Unsuccessful Programming Recovery

If programming a control module is not successful, perform the following procedure:

1. Verify the control module, data link connector and programming tool connections are secure and the tool software is up to date.

2. Ignition » On / Vehicle » In Service Mode
3. Access SPS and follow the on-screen instructions for the control module: K115 Reductant Control Module

   Verify the control module programming is successful.

⇒ **If the programming is not successful**

   3.1. Ignition/Vehicle » Off — For greater than 1 min

   3.2. Ignition » On / Vehicle » In Service Mode

   3.3. Access SPS and follow the on-screen instructions for the control module: K115 Reductant Control Module

⇒ If the programming is not successful » Replace the component: K115 Reductant Control Module

⇓ If the programming is successful

   3.4. All OK.

⇓ **If the programming is successful**

4. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the repair: *Diagnostic Repair Verification 3-319*

For control module replacement, programming, and setup refer to: *Control Module References 3-4*

K157 Video Processing Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Verify the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. DO NOT use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- Programming must begin with the Ignition/Vehicle OFF. Programming will direct the appropriate control module(s) to change power mode as needed during the procedure, independent of the vehicle's power mode.
- During programming, it may be necessary to remove specific fuse(s). To prevent programming failure, ensure SPS on-screen instructions are followed for proper fuse removal when necessary.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.
- To prevent programming failure due to unintended wireless drops, it is recommended that a wired MDI connection be used when programming the control module.

Reference Information

Special Tools

EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

Replace and Program Control Module

To program a replacement or an existing control module, perform the following procedure:

1. Ignition/Vehicle OFF.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K157 Video Processing Control Module - Programming and follow the on-screen instructions.
4. Clear DTCs.
5. Calibrate Vehicle Processing Control Module. Refer to: [Link target (target-id 327188-) not found]

Reprogram Control Module

To program a replacement or an existing control module, perform the following procedure:

1. Ignition/Vehicle OFF.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K157 Video Processing Control Module - Programming and follow the on-screen instructions.
4. Clear DTCs.
5. Calibrate Vehicle Processing Control Module. Refer to: [Link target (target-id 327188-) not found]

Unsuccessful Programming Recovery

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module. Refer to [Link target (target-id 300812-) not found] to diagnose these Ethernet circuits.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming System (SPS) and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the control module. All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This can vary depending on vehicle and control module location and can be done by one of the options listed below:
   - Removing all fuses supplying battery voltage and ignition voltage to the control module.
   - Disconnecting all harness connectors from the control module.

Warning: Always ensure the Battery Maintenance Mode is inactive before disconnecting the low voltage 12 volt battery (or batteries). This mode can be active with the ignition off, regardless of whether the vehicle charging cord is plugged in or not. When this mode is active, the on-board high voltage battery charger(s) will energize the 12 volt battery cables and charge the 12 volt battery (or batteries). Disconnecting any battery cables while this mode is active may result in an electrical shock or a burn from hot battery cable leads.

   - Check the 12 volt battery voltage with a digital multimeter before disconnecting any battery cables leads. If the voltage is 13.5 volts or above, the Battery Maintenance Mode is active. The technician must wait for the T18 battery charger to deactivate before disconnecting the battery negative cable. For more information refer to *Charging System Description and Operation 6-66* . With Battery Maintenance Mode inactive, perform a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .

3. Reconnect all battery voltage and ignition voltage sources to the control module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the control module, data link connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the control module.
8. Verify the control module can be programmed.

⇒ **If the control module can not be programmed**

   8.1. Ignition ON/Vehicle in Service Mode for 1 min.

   8.2. Ignition/Vehicle OFF.

   8.3. Access SPS and follow the on-screen instructions for the control module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.

   8.4. Verify the control module can be programmed.

⇒ If the control module can not be programmed, replace the control module.

⇓ If the control module can be programmed

   8.5. Clear DTCs.

⇓ **If the control module can be programmed**

9. Clear DTCs.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming and setup

K182 Parking Assist Control Module: Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the control module is not properly configured with the correct calibration software, the control module will not control all of the vehicle features properly.

- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required install the *EL-49642* SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module

To program a replacement control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K182 Parking Assist Control Module - Programming and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select K182 Parking Assist Control Module - Configuration and follow the on-screen instructions.
4. Clear DTCs.

Reprogram Control Module

Do not reprogram the parking assist control module, unless directed by a service procedure, or a service bulletin.

To reprogram an existing control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K182 Parking Assist Control Module - Programming and follow the on-screen instructions.
3. Clear DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition ON. Ensure the K182 Parking Assist Control Module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the parking assist control module can be reprogrammed.

⇒ **If the K182 Parking Assist Control Module cannot be reprogrammed**

    2.1. Ignition OFF for one minute, ignition ON.

    2.2. Verify the parking assist control module can be reprogrammed.

⇒ If the K182 Parking Assist Control Module cannot be reprogrammed, replace the parking assist control module.

⇓ If the K182 Parking Assist Control Module can be reprogrammed.

    2.3. All OK.

⇓ **If the K182 Parking Assist Control Module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming and setup

K194 Rear Gate Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.

- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module

Note: The endgate must be completely closed and latched, if the endgate is open or ajar during programming, the power endgate system may become inoperative without any DTCs indicated

To program a replacement control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K194 Rear Gate Module - Programming and follow the on-screen instructions.
3. At the end of programming, choose the “Clear All DTCs” function on the SPS screen.

Reprogram Control Module

Note: The endgate must be completely closed and latched, if the endgate is open or ajar during programming, the power endgate system may become inoperative without any DTCs indicated

To reprogram an existing control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select K194 Rear Gate Module - Programming and follow the on-screen instructions.
3. At the end of programming, choose the “Clear All DTCs” function on the SPS screen.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for rear gate module replacement, programming and setup

K219 Lighting Control Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required install the *EL-49642* SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module

To program a replacement control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, under Select Controller, select K219 Lighting Control Module.
3. On the SPS Supported Controllers screen, under Select Function / Sequence, select Programming and follow on screen instructions.
4. On the SPS Supported Controllers screen, under Select Function / Sequence, select Setup and follow the on-screen instructions.
5. Clear All DTCs.

Reprogram Control Module

Do not reprogram the lighting control module, unless directed by a service procedure, or a service bulletin.

To reprogram an existing control module, perform the following procedure:

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, under Select Controller, select K219 Lighting Control Module.
3. On the SPS Supported Controllers screen, under Select Function / Sequence, select Programming and follow on screen instructions.
4. Clear All DTCs.

Unsuccessful Programming Recovery

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module. Refer to [Link target (target-id 300812-) not found] to diagnose these Ethernet circuits.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming Systems and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the control module. All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This can vary depending on vehicle and control module location and can be done by one of the options listed below:
   - Removing all fuses supplying battery voltage and ignition voltage to the control module.
   - Disconnecting all harness connectors from the control module.

   Warning: Always ensure the Battery Maintenance Mode is inactive before disconnecting the low voltage 12 volt battery (or batteries). This mode can be active with the ignition off, regardless of whether the vehicle charging cord is plugged in or not. When this mode is active, the on-board high voltage battery charger(s) will energize the 12 volt battery cables and charge the 12 volt battery (or batteries). Disconnecting any battery cables while this mode is active may result in an electrical shock or a burn from hot battery cable leads.

   - Check the 12 V battery voltage with a digital multimeter before disconnecting any battery cables leads. If the voltage is 13.5 V or above, the Battery Maintenance Mode is active. The technician must wait for the T18 Battery Charger to deactivate before disconnecting the battery negative cable. For more information, refer to *Charging System Description and Operation 6-66* . With Battery Maintenance Mode inactive, perform a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .
3. Reconnect all Battery voltage and Ignition voltage sources to the Control Module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the control module, data link connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the K219 Lighting Control Module.
8. Verify the control module can be programmed.

⇒ **If the control module can not be programmed**

8.1. Ignition ON/Vehicle in Service Mode for 1 min.

8.2. Ignition/Vehicle OFF.

8.3. Access SPS and follow the on-screen instructions for the K219 Lighting Control Module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.

8.4. Verify the control module can be programmed.

⇒ If the control module can not be programmed, replace the K219 Lighting Control Module.

⇓ If the control module can be programmed

8.5. Clear DTCs.

⇓ **If the control module can be programmed**

9. Clear DTCs.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for control module replacement, programming and setup

K234 Rear Seat Heater Vent Control Module: Programming and Setup

This device does not require programming or setup.

P16 Instrument Panel Cluster Control Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or Control Module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), and HVAC.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.
- To prevent programming failure due to unintended wireless drops, It is recommended that a wired MDI connection be used when reprogramming the Instrument Cluster.

Reference Information

Special Tools

EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

Diagnostic Aids

The programming steps in the Service Programming System (SPS) screens may not be in functional order. Be sure to follow the programming steps in the order listed below.

A successful Serial Data Authentication Configuration must occur prior to proceeding with the P16 Instrument Cluster – Setup, proceeding without a successful Serial Data Authentication Configuration will corrupt the P16 Instrument Cluster – Setup.

Replace and Program Control Module (UDC or UDD)

To program a replacement or an existing Control Module, perform the following procedure:

1. Ignition ON/Vehicle in Service Mode.
2. Disconnect Wi-Fi dongle from MDI 2.
   Install *EL-52100* (MDI 2) using wired USB Connection from MDI 2 to PC.
3. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12 V system during SPS programming events.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. Ignition/Vehicle OFF.
6. On the SPS Supported Controllers screen, select P16 Instrument Cluster – Programming and follow the on-screen instructions.

Note: If the Setup step fails and the Programming step is successful, perform the Serial Data Authentication Configuration procedure and then repeat the Setup step. Refer to: *Serial Data Authentication Configuration 3-49*

7. On the SPS Supported Controllers screen, select P16 Instrument Cluster – Setup and follow the on-screen instructions.
8. Clear DTCs.

Replace and Program Control Module (UDV or UHS)

To program a replacement or an existing Control Module, perform the following procedure:

1. Ignition ON/Vehicle in Service Mode.

Note: Ensure programming of this module is performed using the EL-52100 (MDI 2). Using the EL-47955 (MDI) will result in a programming failure.

2. Disconnect Wi-Fi dongle from MDI 2.
   Install *EL-52100* (MDI 2) using wired USB Connection from MDI 2 to PC.

3. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12 V system during SPS programming events.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. Ignition/Vehicle OFF.

Note: In the event that an SPS selection screen appears and selecting Hardware ID is required, this refers to the new Instrument Panel Cluster Control Module hardware Bootloader part number which can be viewed in GDS2

6. On the SPS Supported Controllers screen, select P16 Instrument Cluster – Graphics Programming and follow the on-screen instructions.
7. On the SPS Supported Controllers screen, select P16 Instrument Cluster – Programming and follow the on-screen instructions.

Note: If the Setup step fails and the Programming step is successful, perform the Serial Data Authentication Configuration procedure and then repeat the Setup step. Refer to: *Serial Data Authentication Configuration 3-49*

8. On the SPS Supported Controllers screen, select P16 Instrument Cluster – Setup and follow the on-screen instructions.

Note: If Ethernet programming fails, ensure Instrument Cluster is communicating over Ethernet properly. Refer to [Link target (target-id 300812-) not found]

9. Clear DTCs.

Reprogram Control Module (UDC or UDD)

To program a replacement or an existing Control Module, perform the following procedure:

1. Ignition ON/Vehicle in Service Mode.

Note: Ensure programming of this module is performed using the EL-52100 (MDI 2). Using the EL-47955 (MDI) will result in a programming failure.

2. Disconnect Wi-Fi dongle from MDI 2. Install *EL-52100* (MDI 2) using wired USB Connection from MDI 2 to PC.
3. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12 V system during SPS programming events.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. Ignition/Vehicle OFF.
6. On the SPS Supported Controllers screen, select P16 Instrument Cluster – Programming and follow the on-screen instructions.
7. Clear DTCs.

Reprogram Control Module (UDV or UHS)

To program a replacement or an existing Control Module, perform the following procedure:

1. Ignition ON/Vehicle in Service Mode.

Note: Ensure programming of this module is performed using the EL-52100 (MDI 2). Using the EL-47955 (MDI) will result in a programming failure.

2. Disconnect Wi-Fi dongle from MDI 2. Install *EL-52100* (MDI 2) using wired USB Connection from MDI 2 to PC.
3. Install an approved battery maintainer or power supply that provides a steady and stable voltage to support the 12 V system during SPS programming events.
4. Access the Service Programming System (SPS) and follow the on-screen instructions.
5. Ignition/Vehicle OFF.
6. On the SPS Supported Controllers screen, select P16 Instrument Cluster – Graphics Programming and follow the on-screen instructions.
7. On the SPS Supported Controllers screen, select P16 Instrument Cluster – Programming and follow the on-screen instructions.

Note: If Ethernet programming fails, ensure Instrument Cluster is communicating over Ethernet properly. Refer to [Link target (target-id 300812-) not found]

8. Clear DTCs.

Unsuccessful Programming Recovery

Note:

- Ensure the *EL-52100* (MDI 2) is used when programming the vehicle. Using the EL-47955 (MDI) will result in a programming failure.
- It may be necessary to use another *EL-52100* (MDI 2) and/or cables to verify proper operation to eliminate the possibility of faulty equipment.
- If Ethernet programming fails, ensure there is no fault in the Ethernet circuits between the X84 Data Link Connector and K56 Serial Data Gateway Module. Refer to [Link target (target-id 300812-) not found] to diagnose these Ethernet circuits.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Exit Service Programming System (SPS) and disconnect all programming equipment from the vehicle.
2. Disconnect all battery voltage or ignition voltage sources from the control module. All voltage sources must be removed for a minimum of 10 min. This can be done several ways and should be completed by using the least intrusive way. This

can vary depending on vehicle and control module location and can be done by one of the options listed below:

- Removing all fuses supplying battery voltage and ignition voltage to the control module.
- Disconnecting all harness connectors from the control module.

Warning: Always ensure the Battery Maintenance Mode is inactive before disconnecting the low voltage 12 volt battery (or batteries). This mode can be active with the ignition off, regardless of whether the vehicle charging cord is plugged in or not. When this mode is active, the on-board high voltage battery charger(s) will energize the 12 volt battery cables and charge the 12 volt battery (or batteries). Disconnecting any battery cables while this mode is active may result in an electrical shock or a burn from hot battery cable leads.

- Check the 12 volt battery voltage with a digital multimeter before disconnecting any battery cables leads. If the voltage is 13.5 volts or above, the Battery Maintenance Mode is active. The technician must wait for the T18 battery charger to deactivate before disconnecting the battery negative cable. For more information refer to *Charging System Description and Operation 6-66* . With Battery Maintenance Mode inactive, perform a 12 V battery disconnect by disconnecting the battery negative cable. Refer to [Link target (target-id 37733-) not found] .

3. Reconnect all battery voltage and ignition voltage sources to the control module.
4. Close down the current session of Techline Connect and reopen a new session.
5. Verify the control module, data link connector, and programming tool connections are secure and the tool software is up to date.
6. Ignition/Vehicle OFF, ensure that the key fob is inside the vehicle and not moved for the duration of the programming to prevent an inadvertent power mode change during programming.
7. Access the Service Programming System (SPS) and follow the on-screen instructions for the control module.
8. Verify the control module can be programmed.

⇒ **If the control module can not be programmed**

8.1. Ignition ON/Vehicle in Service Mode for 1 min.

8.2. Ignition/Vehicle OFF.

8.3. Access SPS and follow the on-screen instructions for the control module.

Note: If programming is still not successful after the second programming attempt, check the following:

- For facilities using an internet firewall, ensure firewall settings are not blocking file downloads and/or require elevated rights.
- For United States and Canada GM dealers, the appropriate firewall settings can be found in the GM DEALER INFRASTRUCTURE & SECURITY GUIDELINES (DISG) section 2.d.vii.
- For optimal consistency during the reprogramming session, we recommend connecting the PC to a hardwired Ethernet cable, as the large software file size may affect stability.

8.4. Verify the control module can be programmed.

⇒ If the control module can not be programmed, replace the control module.

⇓ If the control module can be programmed

8.5. Clear DTCs.

⇓ **If the control module can be programmed**

9. Clear DTCs.

T1 Accessory AC and DC Power Control Module: Programming and Setup

This device does not require programming or setup.

T3 Audio Amplifier: Programming and Setup

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, , etc.

- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Diagnostic Aids

During programming you may be required to select multiple calibrations dependent upon vehicle equipment. Have the vehicle build/RPO information available during the following procedure to ensure the correct calibrations are selected.

Replace and Program Control Module or Reprogram Control Module

To program a replacement or an existing control module, perform the following procedure:

1. Ignition OFF, Vehicle OFF
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select T3 Audio Amplifier – Programming and follow the on-screen instructions.
4. Clear DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

  2.1. Ignition OFF for one minute, ignition ON.

  2.2. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

  2.3. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

T22 Wireless Accessory Charging Module: Programming and Setup

Note:

- Always verify the module has the newest software available before replacing the module.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Replace and Program Control Module

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select T22 Wireless Accessory Charging Module - Programming and follow the on-screen instructions.
3. Clear DTCs.

Reprogram Control Module

1. Access the Service Programming System (SPS) and follow the on-screen instructions.
2. On the SPS Supported Controllers screen, select T22 Wireless Accessory Charging Module - Programming and follow the on-screen instructions.
3. Clear DTCs.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. Ignition ON. Ensure the control module, DLC and programming tool connections are secure and the SPS software is up to date.
2. Verify the control module can be reprogrammed.

⇒ **If the control module cannot be reprogrammed**

  2.1. Ignition OFF for one minute, ignition ON.

  2.2. Verify the control module can be reprogrammed.

⇒ If the control module cannot be reprogrammed, replace the control module.

⇓ If the control module can be reprogrammed.

2.3. All OK.

⇓ **If the control module can be reprogrammed**

3. All OK.

Repair Instructions

Perform the *Diagnostic Repair Verification 3-319* after completing the repair.

Control Module References 3-4 for Control Module replacement, programming and setup

K111 Fuel Pump Power Control Module: Programming and Setup

This control module does not require SPS programming but does require the following setup procedures after a new control module is installed:

Setup for Component Replacement — Fuel Pump Driver Control Module Configuration/ Fuel Pump Power Control Module Configuration

1. Ignition » On / Vehicle » In Service Mode — For 2 min
2. Ignition/Vehicle » Off — For 2 min
3. Ignition » On / Vehicle » In Service Mode
4. Perform the following action: Clear the DTCs.
5. Start Engine
6. Verify DTC P1005 is not set

⇒ **If the DTC sets**

6.1. Perform the following action: Clear the DTCs.

6.2. Ignition/Vehicle » Off — For 2 min

6.3. Start Engine

6.4. Verify the DTC does not set.

⇒ If the DTC sets» Repeat the procedure starting at step 1

⇒ If the DTC is not set » Configuration— Complete

⇓ **If the DTC is not set**

7. Configuration— Complete

Serial Data Authentication Configuration

General Information

Serial Data Authentication Configuration ensures secure communication between control modules over different channels by encrypting sensitive data. Secret keys are written to the control modules, allowing messages on the bus to be encrypted.

- During the process, control module data is retrieved from the vehicle to generate unique cryptographic keys.
- These keys are then written to each control module, allowing secure communication between control modules.
- In the case of control module replacement, re-running the configuration is required to introduce the new control module to the network; otherwise, communication will fail due to unrecognized messages.

Reference Information

Special Tools

EL-52100 Multiple Diagnostic Interface 2 (MDI 2)

Serial Data Authentication Configuration

Note: Before attempting to perform the Serial Data Authentication Configuration procedure,

- Make sure all CAN control modules are connected and communicating.
- Diagnose the following communication DTCs first: DTC U0073-U007E, U0100-U02FF, U1100-U12FF, U1600-U17FF, U1977, U1978, U2200-U23FF, and U2400-U25FF.
- Diagnose the following programming DTCs: U3000 51, U3000 52, U3000 53, U3000 56, and U3000 57.
- If DTC U1962 is stored only as a history DTC and not retrieved as a current DTC, do not perform the Serial Data Authentication Configuration procedure.
- DO NOT perform the Serial Data Authentication Configuration procedure unless directed to by a service procedure or a service bulletin.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Check the 12 V battery with a digital multimeter and ensure the voltage is above 12.5 V. When required, install a battery maintainer or

power supply that provides a steady and stable voltage. DO NOT use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.

1. Ignition/Vehicle OFF, keep the key inside the vehicle.
2. Access the Service Programming System (SPS) and follow the on-screen instructions.

Note: The Serial Data Authentication Configuration button is located in the lower right corner of the SPS Supported Controllers screen in the Techline Connect system.

3. On the SPS Supported Controllers screen, select Serial Data Authentication Configuration button and follow the on-screen instructions.
4. Ignition/Vehicle OFF, disconnect the scan tool from the vehicle, all access doors closed, all vehicle systems OFF, and all keys at least 3 m (9.8 ft) away from vehicle. Allow the vehicle to go into sleep mode.
5. Ignition ON/Vehicle In Service Mode.
6. Using a scan tool, clear DTCs.

Troubleshooting

Serial Data Authentication Configuration can fail for several reasons. After confirming all control modules are fully programmed and that no underlying issues exist, follow these steps to attempt a successful configuration:

1. Verify X84 Data Link Connector (DLC) Connection: Ensure the X84 Data Link Connector is securely attached to the vehicle.
2. Use a Direct MDI 2 Connection: Connect the scan tool directly to the computer via a wired connection instead of using wireless connection (Techline Connect may need to be reset to change the connection type).
3. Disconnect the 12 V Battery: Reset the vehicle systems by disconnecting the 12 V battery negative cable for 1 min. For electric vehicles, check the 12 V battery voltage with a digital multimeter before disconnecting any battery cables leads. If the voltage is 13.5 V or above, the Battery Maintenance Mode is active. The technician must wait for the T18 Battery Charger to deactivate before disconnecting the battery negative cable. Follow the appropriate steps in the Battery Negative Cable Disconnection and Connection procedure located under the Starting, Charging, and Low Voltage Energy Storage category.
4. Perform the Serial Data Authentication Configuration procedure. If the procedure still fails, inspect the X84 Data Link Connector for contamination, corrosion, and terminal tension and inspect the wiring between the X84 Data Link Connector and K56 Serial Data Gateway Module for any faults.

In the case of a Serial Data Authentication Configuration failure, the SPS error window should point to which control module is failing:

- Function: “Key Provisioning” refers to Serial Data Authentication Configuration.
- Sub Function: refers to which step in the process failed.
- ECU: refers to the failing control module if that is the case.

If the Sub Function column in SPS error window points to a “Configure Link” error, run through the trouble shooting steps 1-4 above.

If no SPS error window is displayed, but the SPS screen indicates that Serial Data Authentication Configuration has Failed, run through the trouble shooting steps 1-4 above.

Service Programming System (SPS)

For step-by-step control module programming instructions, please refer to the techline information system (TIS) terminal.

Review the information below to ensure proper programming protocol.

Note:

- DO NOT program a control module unless you are directed by a service procedure or you are directed by a General Motors service bulletin. Programming a control module at any other time will not permanently correct a customers concern.
- It is essential that the TIS terminal, MDI/MDI2, and/or Scan Tool, is equipped with the latest software before performing service programming.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required, install a battery maintainer or power supply that provides a steady and stable voltage. Do not use a battery charger, as charging voltage will often fluctuate when connected to the vehicle. This may interrupt programing. If a battery maintainer is not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Some modules will require additional programming/setup events to be performed before or after programming.

- Some vehicles may require the use of a CANDi or MDI/MDI2 module for programming.
- Review the appropriate service information for these procedures.
- DTCs may set during programming. Clear DTCs after programming is complete.
- Clearing powertrain DTCs will set the Inspection/ Maintenance (I/M) system status indicators to NO.

Ensure the following conditions are met before programming a control module:

1. Vehicle system voltage:
    - There is not a charging system concern. All charging system concerns must be repaired before programming a control module.
    - Battery voltage is greater than 12 volts but less than 16 volts. The battery must be fully charged before programming the control module.
    - Turn OFF or disable any system that may put a load on the vehicles battery, such as the following components:
        - Interior lights
        - Exterior lights including daytime running lights (DRL)—Applying the parking brake, on most vehicles, disables the DRL system
        - Heating, ventilation, and air conditioning (HVAC) systems
        - Engine cooling fans
        - Radio, etc.
2. The ignition switch must be in the proper position. SPS prompts you to turn ON the ignition, with the engine OFF. DO NOT change the position of the ignition switch during the programming procedure, unless instructed to do so.
3. Make certain all tool connections are secure, including the following components and circuits:
    - Scan Tool
        - The RS-232 communication cable port
        - The connection at the data link connector (DLC)
        - The voltage supply circuits
    - MDI/MDI2
        - The USB, Ethernet or Wireless communication port
        - The connection at the data link connector (DLC)
4. DO NOT disturb the tool harnesses while programming. If an interruption occurs during the programming procedure, programming failure or control module damage may occur.

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all control module and DLC connections are secure and the TIS terminal operating software is up to date.
2. Attempt to reprogram the control module.
3. If the control module can still not be programmed, turn the ignition OFF for at least one minute.
4. Turn the ignition ON and attempt to reprogram the control module. The control module should program.
    ⇒ If the control module still cannot be programmed, replace the control module.

After successfully programming the control module, ensure that all post programming procedures are performed; refer to *Control Module References 3-4* for the appropriate control module Programming and Setup document for any required procedures.

Q77 Transmission Control Solenoid Valve Characterization Programming

The solenoids in this transmission require unique performance characteristic data in order to function at maximum efficiency. This data is programmed and stored in the vehicle’s transmission control module (TCM). When a transmission assembly, TCM, or solenoids are replaced during service, the performance characteristic data for the solenoids must be retrieved from a web server “cloud” repository and reprogrammed into the TCM.

Reprogramming also ensures that the characteristic data relationship is properly matched between the solenoids, valve body, and transmission.

Solenoid characterization reprogramming is performed using the TIS2Web Service Programming System (SPS).

Solenoid Reprogramming Procedure

Perform solenoid characterization reprogramming after one of the following service procedures:

Note: Select “Replace Transmission” at the MCVM Characterization selection screen.

- Replace transmission assembly

Note: Select “Replace Control Valve Solenoid Body” at the MCVM Characterization selection screen.

- Replace control valve solenoid body

Note: Select “Replace Solenoid” at the MCVM Characterization selection screen.

- Replace solenoid (currently not an available Service Procedure)

Note: Select “Refresh Characterization Data” at the MCVM Characterization selection screen.

- Replace TCM

Note: Select “Refresh Characterization Data” at the MCVM Characterization selection screen.

- Solenoid characterization may also be performed to “refresh” characterization data.

To perform solenoid characterization after a transmission component replacement:

1. Document the new Transmission Unique Number (TUN). The TUN location may be found here: [Link target (target-id 315221-) not found] . Since the TUN can be difficult to access when the transmission is installed in the vehicle, ensure you document the 16-digit TUN prior to installing the transmission in the vehicle.
2. Use a generically available QR Code/data matrix scanner to obtain the Part Unique Number (PUN). The PUN location may be found here: [Link target (target-id 315238-) not found] . Before installing the control valve solenoid body onto the transmission, document the 22-digit PUN. If the control valve solenoid body PUN has not been saved for reference, it may be necessary to disassemble the control valve solenoid body from the transmission to clearly read the control valve solenoid body PUN.
3. Log into TIS2Web/SPS.
4. Type the vehicle identification number (VIN).
5. Perform the SPS Transmission Control Module programming event.
   - Select “Transmission Control Module - Programming” to update TCM calibrations and Solenoid Characterization data.

     OR
   - Select “Transmission Control Module - MCVM Operations” to update Solenoid Characterization data only.

Note: TUN/PUN is case sensitive. Letters should be entered in all capitals.

6. From the “MCVM (Mechanical Characterization and Virtual Matching) Operation Selection” screen, select the applicable service procedure to be performed. You will be prompted to provide the necessary Transmission Unique Number (TUN) when replacing a transmission part.

At this point, the system will read the VIN from the engine control module (ECM) using the multiple diagnostic interface (MDI) and then retrieve the applicable genealogy data tree from the cloud. This data tree accesses the original characterization data so that it may be updated with the new component information. The system acquires characterization data for the given TUN/PUN via the cloud and updates the genealogy tree. The TCM is updated with the correct solenoid characterization data, and the cloud is updated with the new genealogy relationship.

Description and Operation

Over The Air Description and Operation

Each item in the list below represents topics covered in detail below.

- Over The Air (OTA) Description
- OTA Software Download
- Installing an Update
- Deferring or Declining an Update
- Unable to Complete
- Proper Battery Charging

Over The Air (OTA) Description

The Over The Air (OTA) feature was designed to install vehicle software updates remotely. Remote software update is an in-vehicle feature that enables the installation of a software package to update certain modules without requiring service test equipment to be physically connected to the vehicle. Remote software updates will utilize a long range or short range connection from the host module to a remote IT system. There must be an active 4G LTE or WiFi connection to download and install vehicle software updates. The customer does not need an active OnStar subscription but they do need to accept the vehicle Terms and Conditions to be eligible to receive OTA vehicle software updates.

Note: Fleet vehicles must be activated as a Fleet account (not a business account) and require a separate Terms and Conditions agreement to be completed. Please see your fleet administrator for assistance with completing this agreement.

OTA software updates that are pushed to vehicles remotely continue to expand in frequency and use on GM models. Vehicles using the Global A electrical architecture can support three modules for OTA updates, such as the radio, OnStar, and Serial Data Gateway modules.

The new Vehicle Intelligence Platform (VIP) electrical architecture, introduced on some 2020 vehicles and beyond, powers a new electronic system that is capable of managing up to 4.5 terabytes of data processing power per hour, which is a fivefold increase in capability over the previous Global A electrical architecture. On vehicles using the VIP architecture, virtually all modules can support OTA updates, which means that the OTA software is not only for the infotainment system.

When an OTA update has been downloaded to a vehicle and is available to be installed, a message is displayed on the infotainment screen notifying the driver of the impending update. The message to accept and install an OTA update will not appear until the minimum values for the battery State of Charge (SOC) and Outside Ambient Temperature (OAT) are met.

OTA Software Download

An OTA update can be pushed to a vehicle while the vehicle is parked or being driven. There is an option for notification to the driver that the software update is being downloaded to the vehicle, the default setting is set to off. Battery SOC and OAT values are not checked before a download. These checks are only performed once the software update is downloaded and ready to be installed.

The OTA software download can occur in increments. Download will not be paused while the vehicle is being driven, it continues in the background. If the vehicle is turned off the download will continue for a maximum of 10 minutes. If the download did not complete it will continue on the next ignition cycle from where it stopped.

Installing an Update

Once the OTA software is downloaded, a message on the infotainment screen will display a prompt to accept the installation. The customer does not need to remain in the vehicle during the installation of the software. However, the vehicle cannot be driven during the installation and certain vehicle features may not be available. It’s not required for the ignition to be ON for the installation to begin.

Installation time will vary based on the size of the update. The average installation will take approximately 15 minutes. Depending on the module, it may take longer to complete. The “Accept” message on the infotainment screen will provide an estimation of the approximate installation time. The customer may also comment that the radio appears to stay on after exiting the vehicle.

Deferring or Declining an Update

When an OTA update is downloaded, customers have the option to defer or decline the installation. The standard policy for OTA software updates is to set the customer notifications to 30 ignitions cycles. If the customer does not act upon the prompts within this counter, the update package is removed from the vehicle.

If a customer ignores the notification, the ignition cycle counter decreases by one immediately.

If the customer defers the installation by selecting the “Remind Me Later” option, the ignition cycle counter decreases by one, but it will not decrease again until after the customer-selected “Remind Me Later” period, regardless of the number of ignition cycles that occur during that period. For example, if 24 hours is selected for the next remind me time frame and 20 ignition cycles occurred, those 20 ignition cycles do not decrease the ignition cycle counter.

Note: For customer use case, standard operating procedure for campaign is to set the notifications to 30 ignitions cycles. If the Customer does not act upon the prompts within this counter, the package / invite is removed from the vehicle. In this scenario, we will wait 2 weeks and re-enroll back into the campaign. FYI: this counter can be selected from 1 to 999 ignition cycles when setting up the campaign.

If the OTA update installation is deferred by the customer, it can be installed at a later date through the Vehicle Software menu under Settings > System on the infotainment screen.

If the customer selects the “Decline Update” option, the update package is immediately removed from the vehicle. In this case, the vehicle will not be re-enrolled to receive the OTA update at a later date, unless the update is a Field Action. OTA updates will not be installed in a vehicle without a customer’s consent. One exception with Constraint Consent use case there is a “May day” counter set in the vehicle, typically 10 ignition cycles. The Customer has that many ignition cycles to complete the update. Upon using all notifications, the installation will take place once this counter has expired. This use case is only for Cyber Critical recall Field Actions and requires Global Safety Field Investigations approval to utilize this use case. To date, this use case has not been used for any field actions.

Unable to Complete

There are a number of criteria that must be met in order to successfully complete the software update installation on a vehicle. The most common cause of being unable to complete an installation is the State of Charge (SOC) of the 12V battery. If the 12V battery does not meet the minimum SOC requirement of 70 percent or greater along with an Outside Ambient Temperature (OAT) greater than 14°F (-10°C), the OTA update installation will not occur. The colder the ambient air temperature is, the higher the target SOC becomes. To determine the battery SOC for VIP vehicles, go to BCM/12V Battery/Battery Sensor Module – State of Charge in GDS 2.

There may be other conditions that will affect an OTA update installation. If any of these conditions are present, a “Vehicle Conditions Not Ideal” message may display on the infotainment screen stating that conditions are not ideal to proceed with the update installation. These conditions do not indicate a failure; only that the vehicle does not meet all the criteria necessary to complete the OTA update installation.

Some customers may comment that the radio appears to stay on or is backlit after exiting the vehicle. If this occurs, it’s a telltale sign that an OTA update is in progress.

If an OTA fails to update ensure there is no 3rd party dongle connected to the DLC of the vehicle. This could block an OTA from completing.

Proper Battery Charging

If a low battery SOC is preventing the OTA update installation, the 12V battery should be charged to meet the target SOC of 70 percent.

On some GM models, connecting the battery charger directly to the 12V battery posts will bypass the Battery Sensor Module, resulting in a default SOC value of 65 percent and a “Conditions Not Met” message.

Note: The Battery Sensor Module is attached directly to the battery negative terminal. It determines the battery condition by calculating the battery SOC, functions, and state of health, which is used to help determine if the 12V Stop/Start system will allow an Auto Stop when the vehicle has come to a stop. To properly charge the battery, the negative lead of the charger must be connected to chassis ground, and not directly to the negative battery post. Connecting to chassis ground allows current to flow through the Battery Sensor Module during charging as well as be monitored. The current cannot be monitored by the Battery Sensor Module if the negative lead of the charger is directly connected to the negative battery post.If a battery is improperly charged, the Battery Sensor Learn will be required to calibrate the Battery Sensor Module. With the ignition off, let the vehicle rest for a minimum of four hours without any interruptions (opening a door, using the key fob, etc.). Verify if the battery SOC is 70 percent or greater using GDS 2 before attempting to continue with an OTA update.

Special Tools and Equipment

Special Tools

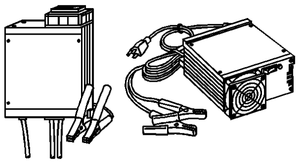
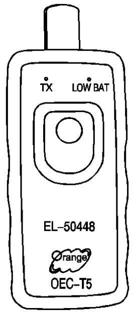
Illustration	Tool Number/ Description
	EL 49642 SPS Programming Support Tool
	EL 50448 Tire Pressure Monitor Sensor Activation Tool
	EL 52100 Multi Diagnostic Interface 2 (MDI 2)

Illustration	Tool Number/ Description
 5331982	EL 52545 Tire Pressure Monitor Sensor and RF Diagnostic Tool
 5608151	EL 52800 Battery Charger/Tester

Vehicle Diagnostic Information

Specifications

A11 Radio: Scan Tool Information

A11 Radio: Scan Tool Information

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
Data Display			
• Infotainment System Status	—	Run	Indicates the status of the infotainment system.
• Rearview Camera Supply Current	—	Varies	Indicates the rearview camera supply current
• Rearview Camera Supply Voltage	—	10V	Indicates the rearview camera supply voltage..
• Control Module Temperature Sensor 1	—	Varies	This displays the temperature reading of the control module temperature sensor 1.
• Control Module Temperature Sensor 2	—	Varies	This displays the temperature reading of the control module temperature sensor 2.
• Control Module Operation Mode	—	Run	This displays the current operational mode of the control module.
• Battery Saver Mode	—	On/Off	Indicates if battery saver mode is active.
Ethernet Bus Data			
• Ethernet Bus Master Clock	—	Yes/No	Ethernet Bus Master Clock
• Rear Seat Infotainment Module to Radio Ethernet Data Received	—	Yes/No	Indicates if the radio has received data from the rear seat infotainment module.
• Telematics Control Module to Radio Ethernet Data Ready To Transmit	—	Yes/No	Indicates if the telematics control module ethernet data is ready to transmit to the radio.
• Ethernet Port 0 Receive Failure Count	—	Varies	Displays failures in counts (Rear Seat Infotainment)
• Ethernet Port 0 Transmit Failure Count	—	Varies	Displays failures in counts (Rear Seat Infotainment)
• Ethernet Port 1 Receive Failure Count	—	Varies	Displays failures in counts (Audio Amplifier)
• Ethernet Port 1 Transmit Failure Count	—	Varies	Displays failures in counts (Audio Amplifier)
• Ethernet Port 2 Receive Failure Count	—	Varies	Displays failures in counts (Central Gateway Module)
• Ethernet Port 2 Transmit Failure Count	—	Varies	Displays failures in counts (Central Gateway Module)
• Ethernet Port 3 Receive Failure Count	—	Varies	Displays failures in counts (Telematics Control Module)
• Ethernet Port 3 Transmit Failure Count	—	Varies	Displays failures in counts (Telematics Control Module)

Parameter	System State	Expected Value	Description
• Ethernet Port 4 Receive Failure Count	—	Varies	Displays failures in counts
• Ethernet Port 4 Transmit Failure Count	—	Varies	Displays failures in counts
• Ethernet Port 5 Receive Failure Count	—	Varies	Displays failures in counts
• Ethernet Port 5 Transmit Failure Count	—	Varies	Displays failures in counts
• Ethernet Port 6 Receive Failure Count	—	Varies	Displays failures in counts
• Ethernet Port 6 Transmit Failure Count	—	Varies	Displays failures in counts
• Ethernet Port 0 IP Address	—	Varies	Displays ethernet IP address
• Ethernet Port 1 IP Address	—	Varies	Displays ethernet IP address
• Ethernet Port 2 IP Address	—	Varies	Displays ethernet IP address
• Ethernet Port 3 IP Address	—	Varies	Displays ethernet IP address
• Ethernet Port 4 IP Address	—	Varies	Displays ethernet IP address
• Ethernet Port 5 IP Address	—	Varies	Displays ethernet IP address
• Ethernet Port 6 IP Address	—	Varies	Displays ethernet IP address
Configuration Data			
• Manufacturer Enable Counter	—	Varies	Displays in counts
Bluetooth Data			
• Number of Bluetooth Devices Connected	—	Varies 1–10	Indicates the number of Bluetooth paired to the vehicle.
• Bluetooth Device 1: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 1: Friendly Name	—	Varies	The scan tool displays a decimal value between 0 and 255.
• Bluetooth Device 2: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 2: Friendly Name	—	Varies	Displays the bluetooth phone to telematics communication interface control module status.
• Bluetooth Device 3: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 3: Friendly Name	—	Varies	Indicates the name given to the paired device
• Bluetooth Device 4: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active

Parameter	System State	Expected Value	Description
• Bluetooth Device 4: Friendly Name	—	Varies	Indicates the name given to the paired device
• Bluetooth Device 5: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 5: Friendly Name	—	Varies	Indicates the name given to the paired device
• Bluetooth Device 6: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 6: Friendly Name	—	Varies	Indicates the name given to the paired device
• Bluetooth Device 7: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 7: Friendly Name	—	Varies	Indicates the name given to the paired device
• Bluetooth Device 8: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 8: Friendly Name	—	Varies	Indicates the name given to the paired device
• Bluetooth Device 9: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 9: Friendly Name	—	Varies	Indicates the name given to the paired device
• Bluetooth Device 10: Connection Status	—	Varies	Indicates the device status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Device 10: Friendly Name	—	Varies	Indicates the name given to the paired device
GPS Data			
Longitude at Last GPS Fix	—	Varies	Indicates the longitude coordinates at the last GPS signal reveived
Latitude at Last GPS Fix	—	Varies	Indicates the latitude coordinates at the last GPS signal reveived
Audio Data			
Left Rear Audio Output	—	Active/Not Active	Indicates the status of the audio output
Right Front Audio Output	—	Active/Not Active	Indicates the status of the audio output
Left Front Audio Output	—	Active/Not Active	Indicates the status of the audio output
Right Rear Audio Output	—	Active/Not Active	Indicates the status of the audio output
Current AM Frequency	—	Varies	Indicates the current frequency the radio is set to
Current FM Frequency	—	Varies	Indicates the current frequency the radio is set to
Auxiliary Input Data			
Infotainment Control Switch, Switch 1	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Switch 2	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Switch 3	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Switch 4	—	Yes/No	Indicates if the switch is pressed

Parameter	System State	Expected Value	Description
Infotainment Control Switch, Switch 5	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Switch 6	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Switch 7	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Switch 8	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Knob 1 Push Switch	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Knob 1 Rotary Position	—	Varies	Displays the counts when the knob is turned
Infotainment Control Switch, Knob 2 Push Switch	—	Yes/No	Indicates if the switch is pressed
Infotainment Control Switch, Knob 2 Rotary Position	—	Varies	Displays the counts when the knob is turned

A11 Radio: Scan Tool Output Controls

Output Control	Description
Display Check	
Info Display Dimming	Allows control of the info display dimming
Backlight Dimming	Allows control of the backlight dimming
Rearview Camera Display	Allows the rearview camera to be turned on and off
Radio Controls	
Radio Tuner AM Frequency	Allows control of the AM tuner frequency
Radio Tuner FM Frequency	Allows control of the FM tuner frequency

A26 Heater and Air Conditioning User Interface Control - Front: Scan Tool Information

A26 Heater and Air Conditioning User Interface Control– Front Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/ Vehicle in Service Mode			
Base Model Part Number	—	Varies	The 8– Digit Base Model Part Number is the part number for the hardware without software and calibrations.
Base Model Part Number – Alpha Code	—	Varies	The scan tool displays the Base Model Alpha Code
Boot Software Number	—	Varies	The scan tool displays the 8– Digit Boot Software Part Number
Communication Channel Status – CAN	—	Varies	The scan tool displays the status of the CAN Bus
Diagnostic Data Identifier	—	Varies	The scan tool displays the 4 character alphanumeric device ID.
End Model Part Number	—	Varies	The 8– Digit End Model Part Number is the part number for the hardware of the control module with software and calibrations.
End Model Part Number – Alpha Code	—	Varies	The scan tool displays the End Model Alpha Code

Parameter	System State	Expected Value	Description
Power Mode	—	Run	The scan tool displays the current vehicle power mode.
Vehicle Identification Number (VIN)	—	Varies	The scan tool displays the learned VIN

B174W Frontview Camera: Scan Tool Information

Note: Due to software and hardware variations, not all information may be applicable.

Front View Camera Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Lane Departure Warning ON			
System Voltage	—	Varies	The scan tool displays the system voltage depending of the current battery voltage.
System Power Mode	—	Run	The scan tool displays Off, Accessory, Run, Cranking or Undefined. This is the state of the ignition switch.
Power Mode Controlled by Backup Device	—	Run	The scan tool displays Off, Accessory, Running or Cranking depending of the current power mode.
Frontview Camera System Status	—	On	The scan tool displays Normal, Malfunction or Undefined depending on the state of the Frontview Camera System.
Frontview Camera Calibration Status	—	Learn Successful	The scan tool displays Not Calibrated, Calibrated, Dynamically Calibrated or Undefined. This is the current state of the calibration.
Frontview Camera Learn Mode Status	—	Yes	The scan tool displays percentage between 0–100% depending on the state of the frontview camera learn mode.
Distance to Object	—	Varies	The scan tool displays meters between 0–255 depending on the distance from a detectable object to the vehicle.
Lane Departure Warning Status	—	Varies	The scan tool displays Off, Disabled, Not Ready to Assist, Ready to Assist, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.
Lane Keep Assist Status	—	Varies	The scan tool displays Off, Disabled, Not Ready to Assist, Ready to Assist, Malfunction, Unknown or Undefined depending on the state of the lane keep assist system.
Lane Departure Warning Switch Status	—	Open	The scan tool displays Open or Closed, depending on the state of the lane departure warning switch.
Lane Keep Assist Switch Status	—	Open	The scan tool displays Open or Closed, depending on the state of the lane keep assist switch.
Lane Departure Warning Indicator Status	—	Off	The scan tool displays Off, On, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.
Forward Collision Alert Function Status	—	Off	The scan tool displays Off, On, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.
Automatic High Beam Activation Status	—	Enabled	The scan tool displays Disabled, Enabled or Undefined depending on the state of the automatic high beam assist system.

Parameter	System State	Expected Value	Description
Frontview Camera Disable History 1–4	—	Varies	The scan tool displays Empty, Lane Departure Warning Indicator Malfunction, Lane Departure Warning Switch Malfunction, Sensors Obstructed, Accelerator Pedal Position Out of Range, Driven Wheel Speed Signal Invalid, Non-Driven Wheel Speed Invalid, Brake Pedal Moderate Travel Signal Invalid, Brake Pedal Initial Travel Position Achieved, Lost Communication with Steering Wheel Angle Sensor Module, Invalid Data Received From Steering Wheel Angle Sensor Module, Forward Collision Alert Switch Malfunction, Clutch Pedal Position (CPP) Sensor Performance, Transmission Gear Engaged, Acceleration Sensor Longitudinal Signal, Invalid Data Received From Yaw Rate Sensor Module, Power Mode Controlled by Backup Device, System Power Mode, Overvoltage, Undervoltage or Undefined depending on the history data of the frontview camera disable history.
Glare Free High Beam Assist	—	Varies	The scan tool displays Off, Disabled, Malfunction, Enabled, Unknown, or Undefined.
Following Distance Indicator Status	—	Varies	The scan tool displays Disabled, Not Ready to Assist, Ready to Assist, or Undefined.
Low Beam Decision Reason	—	Varies	The scan tool displays Tail Lights, On Coming Lights, Low Speed, City, Bright Scene, Fog, High Yaw, or Adverse weather
FCA Vehicle Type	—	Varies	The scan tool displays Unknown, Truck, Car, MotorBike, Bicycle, Pedestrian, or Undecided. This is the Forward Collision Alert type.
FCA Number of Vehicle Detected	—	Varies	The scan tool displays the number of vehicles detected between 0–255 depending on the number of vehicles detected.

Note: Due to software and hardware variations, not all information may be applicable.

Front View Camera Module Scan Tool Output Controls

Output Control	Description
Clear Disable History Data	The frontview camera control module clears all disable history buffers when commanded from the scan tool.
Forward Collision Alert Switch	The frontview camera control module switches the forward collision alert system to Near, Medium or Far when commanded from the scan tool.
High Beams	The frontview camera control module switches the high beams On or Off when commanded from the scan tool.
Lane Departure Warning Indicator	The frontview camera control module switches the lane departure warning indicator On or Off when commanded from the scan tool.
Lane Departure Warning Switch	The frontview camera control module switches the lane departure warning system On or Off when commanded from the scan tool.
Vehicle Direction Camera Learn	The frontview camera control module initializes the service point calibration of the frontview camera and switches into the learn mode when commanded from the scan tool.

B218L Side Object Sensor Module - Left: Scan Tool Information

Scan Tool Output Controls

Output Control	Description
Object Detection Alert Indicators	When commanded by the scan tool, the module will provide power to illuminate the side blind zone indicators in appropriate outside rear view mirror. The outside rear view mirror indicator will illuminate.
Rear Cross Traffic Audible Alert	When commanded by the scan tool, the module will send a signal to the audio system to turn on the rear cross traffic audible alert signal. The audio system will beep.
Rear Cross Traffic Haptic Alert	When commanded by the scan tool, the module will send a signal to the memory seat module to turn on the rear cross traffic haptic alert. The driver’s seat will vibrate.
Rear Cross Traffic Visual Alert	When commanded by the scan tool, the module will turn on the rear cross traffic alert indicators on infotainment display. The infotainment display will illuminate with the appropriate rear cross traffic alert.

B218R Side Object Sensor Module - Right: Scan Tool Information

Scan Tool Output Controls

Output Control	Description
Object Detection Alert Indicators	When commanded by the scan tool, the module will provide power to illuminate the side blind zone indicators in appropriate outside rear view mirror. The outside rear view mirror indicator will illuminate.
Rear Cross Traffic Audible Alert	When commanded by the scan tool, the module will send a signal to the audio system to turn on the rear cross traffic audible alert signal. The audio system will beep.
Rear Cross Traffic Haptic Alert	When commanded by the scan tool, the module will send a signal to the memory seat module to turn on the rear cross traffic haptic alert. The driver’s seat will vibrate.
Rear Cross Traffic Visual Alert	When commanded by the scan tool, the module will turn on the rear cross traffic alert indicators on infotainment display. The infotainment display will illuminate with the appropriate rear cross traffic alert.

K4 Assist Step Control Module: Scan Tool Information

Scan Tool Data Parameters

Parameter	Expected Value	Description
Operating Conditions: Ignition ON		
Manual Deploy Status	Normal	Scan tool displays Unknown, Off, Extend to Passenger Position - Left and Right, or Extend to Cargo Position - Left and Right.
Left Assist Step Motor Current	0 A	Scan tool displays the current amperage of the left assist step motor.
Left Assist Step Position	Retracted Position - Left	Scan tool displays Retracted Position - Left, Extend to Passenger Position - Left, Extend to Cargo Position - Left, or Extend to Service Position - Left.
Left Assist Step Position	Count Value	Scan tool displays the current left step position count.
Left Assist Step System Status	Retracted Position - Left	Scan tool displays Retracted Position - Left, Extend to Passenger Position - Left, Extend to Cargo Position - Left, or Extend to Service Position - Left.
Left Assist Step Learn Status	Yes	Scan tool displays Learned if the left step learn has been completed.
Left Front Door Ajar Switch	Inactive	Scan tool displays Inactive if the door is shut, and Active if the door is open.
Left Rear Door Ajar Switch	Inactive	Scan tool displays Inactive if the door is shut, and Active if the door is open.
Right Assist Step Motor Current	0 A	Scan tool displays the current amperage of the right assist step motor.

Parameter	Expected Value	Description
Right Assist Step Position	Retracted Position - Right	Scan tool displays Retracted Position - Right, Extend to Passenger Position - Right, Extend to Cargo Position - Right, or Extend to Service Position - Right.
Right Assist Step Position	Count Value	Scan tool displays the current right step position count.
Right Assist Step System Status	Retracted Position - Right	Scan tool displays Retracted Position - Right, Extend to Passenger Position - Right, Extend to Cargo Position - Right, or Extend to Service Position - Right.
Right Assist Step Learn Status	Yes	Scan tool displays Learned if the right step learn has been completed.
Right Front Door Ajar Switch	Inactive	Scan tool displays Inactive if the door is shut, and Active if the door is open.
Right Rear Door Ajar Switch	Inactive	Scan tool displays Inactive if the door is shut, and Active if the door is open.
Headlamp Switch Signal	Off	Scan tool displays Unknown, Off, Auto, Park Lamps, Headlamp.
Exterior Lighting	Inactive	Scan tool displays Inactive or Active
System Power Mode	Varies	Scan tool displays Off, Accessory, Run, Start Request, or Propulsion Active.
Battery Voltage	Varies	Current voltage of battery.

Scan Tool Output Controls

Output Control	Description
Assist Step Courtesy Lamp	Turns the assist step courtesy lamp ON and OFF.
Extend to Passenger Position - Right	Commands the right assist step to the deployed position.
Extend to Service Position - Right	Commands the right assist step to the fully extended service position.
Retracted Position - Right	Commands the right assist step to the retracted position.
Extend to Passenger Position - Left	Commands the Left assist step to the deployed position.
Extend to Service Position - Left	Commands the Left assist step to the fully extended service position.
Retracted Position - Left	Commands the Left assist step to the retracted position.

K9 Body Control Module: Scan Tool Information

Body Control Module — 12V Battery Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Battery Capacity	—	Varies	The scan tool displays Ah (Amp hr). Ah/20 is the amount of current a battery can supply for 20hrs until the voltage drops to 10.5V.
Battery Current	—	Varies	The scan tool displays Amps. This is the current flowing through the Battery Sensor Module.
Battery Current During Autostop	—	Varies	The scan tool displays Amps. This is the amperage flowing out of battery to maintain vehicle systems during an autostop.
Battery Sensor Internal Temperature Sensor	—	Varies	The scan tool displays temperature in Celsius.

Parameter	System State	Expected Value	Description
Battery Sensor Module - Battery Nominal Resistance	—	Varies	The scan tool displays mOhm. This is the internal impedance of the 12V battery as measured by the Battery Sensor Module.
Battery Sensor Module - Battery Voltage	—	Varies	The scan tool displays Volts. This is the actual 12V battery voltage as measured by the Battery Sensor Module.
Battery Sensor Module - Data Received	—	Yes	The scan tool displays Yes or No. This value indicates that information has been received by the Body Control Module from the Battery Sensor Module.
Battery Sensor Module - Ignition Off Minimum Battery State of Charge	—	Varies	The scan tool displays percentage (%).
Battery Sensor Module - Ignition Off Minimum Battery Voltage	—	Varies	The scan tool displays battery voltage in volts (V). This is the lowest 12V battery voltage recorded during key off.
Battery Sensor Module - Maximum Cranking Current	—	Varies	The scan tool displays maximum cranking current in amperes (A). This is the actual peak value of amps measured by the Battery Sensor Module on the previous engine crank event.
Battery Sensor Module - Minimum Cranking Voltage	—	Varies	The scan tool displays minimum cranking voltage in volts (V). This is the actual lowest voltage measured by the Battery Sensor Module on the previous engine crank event.
Battery Sensor Module - Open Circuit Voltage	—	Varies	The scan tool displays Volts.
Battery Sensor Module - Predicted Minimum Crank Voltage	—	Varies	The scan tool displays Volts. This is a value calculated by the Battery Sensor Module that predicts the minimum voltage during the next engine crank event.
Battery Sensor Module - State of Charge	—	Varies	The scan tool displays percentage (%). This is a measurement of the charge level compared to a fully charged 12V battery as measured by the Battery Sensor Module.
Battery Sensor Module State of Charge Error	—	Varies	The scan tool displays percentage (%).
Battery Sensor Module - State of Charge Status OK	—	—	—
Battery Sensor Module - State of Charge Variance	—	Varies	The scan tool displays percentage (%).
Battery Sulfation Protection Mode	—	—	—

Parameter	System State	Expected Value	Description
Battery Type	—	Default	The scan tool displays Default, Flooded Battery, AGM Battery, Enhanced Flooded Battery, or Lithium Battery.
Battery Voltage Too Low	—	No	The scan tool displays Yes or No.
Charge Recovery Mode Active - Battery Saver Mode	—	0	The scan tool displays a numeric value. This indicates the level that battery saver mode is operating at. This provides an indication of what actions are being taken.
Charge Recovery Mode Active - Battery Disconnected	—	—	—
Charge Recovery Mode Active - Charge Efficiency Off	—	—	—
Charge Recovery Mode Active - Service Tool Request	—	—	—
Charge Recovery Mode Active - State of Charge Loss	—	—	—
Charge Recovery Mode Active - Vehicle Inactive Too Long	—	—	—
Low-Voltage Battery Previous State of Charge	—	Varies	The scan tool displays percentage (%).
Low-Voltage Battery State of Charge	—	Varies	The scan tool displays percentage (%).
Low-Voltage Battery Temperature	—	Varies	The scan tool displays temperature in Celsius (°C).
Net Battery Amp Hours	—	Varies	The scan tool displays Ah. This is the sum of Amp per hour as measured through the Battery Sensor Module.
Net Battery Amp Hours Charged	—	Varies	The scan tool displays Ah.
Net Battery Amp Hours Discharged	—	Varies	The scan tool displays Ah.
Parasitic Current Greater than 0mA Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -5.0A to -10.0A Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current 0mA to -10mA Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -1.25A to -2.5A Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -10mA to -20mA Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.

Parameter	System State	Expected Value	Description
Parasitic Current -40mA to -80mA Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -20mA to -40mA Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -80mA to -160mA Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -10.0A or less Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -2.5A to -5.0A Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -640mA to -1.25A Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -160mA to -320mA Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Parasitic Current -320mA to -640mA Counter	—	Varies	The scan tool displays min. This is a counter that tracks if the current during ignition off is within a particular range.
Stop/Start Mode	—	—	—
Voltage Drop During Autostop	—	Varies	The scan tool displays Volts. This is a measurement of the amount that the battery voltage has dropped during an autostop.

Body Control Module — Brake Pedal Position Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Brake Pedal Position Sensor Fully Released Learn Status	—	Yes	The scan tool displays Yes or No.
Brake Pedal Initial Travel Position Achieved	—	No	The scan tool displays Yes or No.
Brake Pedal Position Switch Circuit Signal	—	—	—
Extended Travel Brake Pedal Position Signal	—	—	—
Extended Travel Brake Pedal Position Switch	—	Inactive	The scan tool displays Active or Inactive.
Torque Converter Clutch/ Cruise Control Brake Pedal Position Switch	—	Inactive	The scan tool displays Active or Inactive.

Body Control Module — Chassis Control Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Drive Mode Select Switch 1	—	Inactive	The scan tool displays Inactive, Switch 1, Switch 2, Switch 3, Switch 4, Switch 5, Switch 6, Switch 7, Switch 8, Open/Short to Battery, Short to Ground, or Invalid. This is the primary bank of switches which the vehicle operator interfaces with for different selectable vehicle operating modes such as Sport Mode, Fuel Economy Mode...
Drive Mode Select Digital Switch 1	—	Inactive	The scan tool displays Active or Inactive. This is a discrete switch the vehicle operator interfaces with to select vehicle operating modes such as Sport Mode, Fuel Economy Mode...
Driver Shift Control Mode Switch	—	Inactive	The scan tool displays Upshift, Downshift, Inactive, or Invalid.
Hill Descent Control Switch	—	Inactive	The scan tool displays Active or Inactive.
Traction Control Switch	—	Inactive	The scan tool displays Active or Inactive. This indicates the state of the input that enables or disables the traction control system, which is a system designed to prevent loss of traction (and therefore the control of the vehicle) when excessive throttle or steering is applied by the driver.

Body Control Module — Content Theft Deterrent Alarm Trigger — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Content Theft Deterrent Alarm Status	—	Has Not Alarmed - No Alarm	The scan tool displays Has Not Alarmed - No Alarm, Alarming - Alarm, or Has Alarmed - Alarm Active. This indicates if the vehicle content theft deterrent system is in alarm mode or not.
Content Theft Deterrent Indicator	—	Off	The scan tool displays Off, On, Flashing Slow, or Flashing Fast. This is the illuminating lamp on the instrument cluster that indicates if the vehicle security system is active or not.
Current Content Theft Deterrent Trigger	—	No Information/None	This indicates what factor led to the activation of the content theft deterrent system.
Content Theft Deterrent Trigger History 1	—	No Information/None	This indicates the factor that led to the first history reason for activation of the content theft deterrent system.

Parameter	System State	Expected Value	Description
Content Theft Deterrent Trigger History 2	—	No Information/None	This indicates the factor that led to the second history reason for activation of the content theft deterrent system.
Content Theft Deterrent Trigger History 3	—	No Information/None	This indicates the factor that led to the third history reason for activation of the content theft deterrent system.
Glass Breakage	—	Not Detected	The scan tool displays Not Detected or Detected. This parameter indicates the damage to glass as a result to breaking. Glass divides into pieces as a result of a sudden or violent action.
Horn Relay Command	—	Inactive	The scan tool displays Active or Inactive. This refers to a request to initiate the sound for a vehicle's loud warning signal. This is used to display whether the Body Control Module is commanding the horn relay to be on or off.
Liftglass	—	Inactive	The scan tool displays Active or Inactive. The liftglass ajar warning light will be illuminated when the liftglass is not properly closed. This parameter indicates if the liftglass active or inactive.
Power Sounder Content Theft Deterrent Alarm Module Command	—	No Alarm	The scan tool displays No Alarm or Alarm Active. The power sounder is part of the vehicle's theft deterrent system. This parameter shows if the power sounder is commanded active (monitoring for vehicle theft attempt) or not.
Power Sounder Content Theft Deterrent Alarm Module Internal Battery State of Charge	—	OK	The scan tool displays OK or Not OK. This parameter describes the internal battery state of charge in the Power Sounder Content Theft Deterrent Alarm Module.
Rear Closure Unlock Command	—	Inactive	The scan tool displays Active or Inactive. This parameter for the rear closure unlock relay or unlock actuator will display On/Off upon the door being commanded to unlock. Commanded ON is when the Body Control Module energizes the rear closure unlock relay/actuator to unlock the door.
Security Indicator Command	—	Inactive	The scan tool displays Active or Inactive. Security Indicator Command refers to the command that is sent out by the module to turn the lamp (symbolic icon) on which acts as an indicator for the active state of the security system.

Parameter	System State	Expected Value	Description
Security Siren Command	—	Not Requested	The scan tool displays Not Requested or Disarmed. This is the serial data command to activate the output circuit for the alarm siren. Alarm siren is like a horn, but will activate during a theft event to warn away intruders.
Ultrasonic Intrusion Sensor	—	Disarmed	The scan tool displays Armed or Disarmed. The rear integration module supplies a low side drive output interface to the Intrusion and Inclination Sensor.
Ultrasonic Intrusion Sensor Disable Switch Signal	—	Inactive	The scan tool displays Active or Inactive. This is the switch which enables/disables the Ultrasonic Intrusion Sensor of the vehicle.
Ultrasonic Intrusion Sensor Malfunction	—	No	The scan tool displays Yes or No. This sensor detects an unauthorized opening of the vehicle's cabin by sending and receiving ultrasonic waves. This indicates the state of the sensor to fail to operate normally.

Body Control Module — Electric Power Management Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Battery Current	—	Varies	The scan tool displays Amps. This is the current flowing through the Battery Sensor Module.
Battery Saver Mode	—	Off	The scan tool displays Off, Assembly Plant Mode, Transport Mode, or Storage Mode.
Battery Saver Mode Ignition Off - Battery Voltage less than 11.6V	—	False	The scan tool displays True or False. This will set with key off if battery voltage drops below 11.6V
Battery Saver Mode Ignition Off - Battery Voltage less than 12.0V	—	False	The scan tool displays True or False. This will set with key off if battery voltage drops below 12.0V.
Battery Saver Mode Ignition Off - Parasitic Current 100mA or greater	—	False	The scan tool displays True or False. This will set with key off if parasitic current is greater than 100mA.
Battery Saver Mode Ignition Off - Parasitic Current 1A or greater	—	False	The scan tool displays True or False. This will set with key off if parasitic current is greater than 1A.
Fuel Economy Mode	—	Active	The scan tool displays Active or Inactive.
Generator Regulator Setpoint	—	—	The scan tool displays Volts.

Parameter	System State	Expected Value	Description
Load Shed Reason	—	Varies	The scan tool displays Amp Hour Demand Too High, Regulated Voltage Control, Hybrid/EV Battery State of Charge Low, Low Voltage, Service Tool Request, Battery Save Mode, or None. This provides indication of what is causing vehicle loads to be turned off in an attempt to prolong 12V battery life.
Load Shed Requested	—	—	—
Low-Voltage Battery Previous State of Charge	—	Varies	The scan tool displays percentage (%).
Low-Voltage Battery State of Charge	—	Varies	The scan tool displays percentage (%).
Low-Voltage Battery Temperature	—	Varies	The scan tool displays temperature in Celsius (°C).
Requested Idle Boost Level	—	Varies	The scan tool displays Assembly Plant Mode, Low Temperature, Ah, HVAC Request, Low Voltage, Remote Start, Service Tool Request, or None.
Regulated Voltage Control Mode	—	Varies	The scan tool displays Remote Start, Fuel Economy Mode, Normal, Charge Recovery Mode, Assembly Plant Mode, or Ignition and Start Switch Start.
Stop/Start Mode	—	—	—

Body Control Module — Front Exterior Lighting Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Headlamp Leveling Function	—	Inactive	The scan tool displays Active or Inactive.
Headlamp Leveling Sensor Learn	—	Learn Not Enabled	The scan tool displays Learn Not Enabled, Learning, Learn Successful, or Learn Failed. This parameter indicates the headlamp learns suspension trim position.
Left Headlamp Vertical Motor Command	—	Inactive	This scan tool displays Active or Inactive.
Right Headlamp Vertical Motor Command	—	Inactive	This scan tool displays Active or Inactive.
Left Auxiliary Daytime Running Lamps	—	Off	The scan tool displays On or Off.
Right Auxiliary Daytime Running Lamps	—	Off	The scan tool displays On or Off.
Left Daytime Running Lamps	—	Off	The scan tool displays On or Off.
Right Daytime Running Lamps	—	Off	The scan tool displays On or Off.
Left Front Auxiliary Park Lamp Command	—	Off	The scan tool displays On or Off.

Parameter	System State	Expected Value	Description
Right Front Auxiliary Park Lamp Command	—	Off	The scan tool displays On or Off.
Left Low Beam Command	—	Inactive	The scan tool displays Active or Inactive.
Right Low Beam Command	—	Inactive	The scan tool displays Active or Inactive.
Left Front Turn Signal Lamp Command	—	Off	The scan tool displays On or Off.
Right Front Turn Signal Lamp Command	—	Off	The scan tool displays On or Off.
Left Front Fog Lamp Command	—	Off	The scan tool displays On or Off.
Right Front Fog Lamp Command	—	Off	The scan tool displays On or Off.
Left Park Lamps Command	—	Off	The scan tool displays On or Off.
Right Park Lamps Command	—	Off	The scan tool displays On or Off.
Left Turn Signal Repeater Lamp Command	—	Off	The scan tool displays On or Off.
Right Turn Signal Repeater Lamp Command	—	Off	The scan tool displays On or Off.
Surround View Exterior Courtesy Lamps Command	—	Off	The scan tool displays On or Off.

Body Control Module — Heated Steering Wheel Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Heated Steering Wheel Indicator	—	Off	The scan tool displays Off, Low, Medium, or High.
Heated Steering Wheel Request Source	—	Switch	The scan tool displays Switch or Remote Vehicle Start.
Heated Steering Wheel Command	—	Off	The scan tool displays Off, Low, Medium, or High.
Heated Steering Wheel Relay	—	Inactive	The scan tool displays Active or Inactive.
Heated Steering Wheel Switch	—	Inactive	The scan tool displays Active or Inactive.
Service Heated Steering Wheel Indicator	—	Inactive	The scan tool displays Active or Inactive.
Heated Steering Wheel Load Reduction	—	Inactive	The scan tool displays Active or Inactive.
Heated Steering Wheel Mode	—	Off	The scan tool displays Off, Remote Vehicle Start, Automatic, or Switch.
Heated Steering Wheel Diagnostic Fault Active - Stuck Switch	—	Inactive	The scan tool displays Active or Inactive.
Heated Steering Wheel	—	Inactive	The scan tool displays Active or Inactive.
Heated Steering Wheel Internal Temperature	—	Off	The scan tool displays Off, Low, Medium, or High.

Body Control Module — HVAC Sensor Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
A/C Evaporator Temperature	—	Varies	The scan tool displays temperature in Celsius (°C) or Fahrenheit (°F). This parameter refers to the sensor used to determine the temperature of the air conditioning system's evaporator. The temperature is displayed with a low level of detail.
A/C Evaporator Temperature	—	Varies	The scan tool displays temperature in Celsius (°C) or Fahrenheit (°F). This parameter indicates the temperature (degrees of heat) of the air conditioning system's evaporator.
Ambient Air Temperature	—	Varies	The scan tool displays temperature in Celsius (°C) or Fahrenheit (°F). This parameter indicates the temperature of the air surrounding the vehicle.
Humidity Level at the Windshield	—	Varies	The scan tool displays percentage (%). This is the measurement of the amount of moisture near the windshield that is used by the heating, ventilation, air conditioning (HVAC) system to prevent fogging.
Left Front HVAC Mode Status	—	Not Determined	The scan tool displays Not Determined, Off, Auto, Floor, Floor and Vent, Vent, Vent and Windshield, Windshield, Floor and Windshield, or Floor and Vent and Windshield, or Max Defrost. This parameter describes what state the heating, ventilation, air conditioning system is in for the front left area of the vehicle cabin.
Left Front Passenger Compartment Air Temperature	—	Varies	The scan tool displays the amount of heat in the air in the left front area of the interior cabin of the vehicle in Celsius (°C) or Fahrenheit (°F).
Left Rear HVAC Mode Status	—	Not Determined	The scan tool displays Not Determined, Off, Auto, Floor, Floor and Vent, Vent, Vent and Roof, Roof, Roof and Floor, or Floor and Vent and Roof. This parameter describes what state the heating, ventilation, air conditioning system is in for the rear left area of the vehicle cabin.
Passenger Compartment Air Temperature Sensor Voltage	—	Varies	The scan tool displays the voltage of the passenger compartment air temperature sensor in mV.

Parameter	System State	Expected Value	Description
Passenger Compartment Humidity	—	Varies	The scan tool displays percentage (%). The parameter indicates the amount of water in the air in the passenger compartment.
Rear Lower Duct Air Temperature Sensor Voltage	—	Varies	The scan tool displays Volts. This is a temperature sensor used to monitor the air temperature from the rear floor ducts.
Right Front HVAC Mode Status	—	Not Determined	The scan tool displays Not Determined, Off, Auto, Floor, Floor and Vent, Vent, Vent and Windshield, Windshield, Floor and Windshield, or Floor and Vent and Windshield, or Max Defrost. This parameter describes what state the heating, ventilation, air conditioning system is in for the front right area of the vehicle cabin.
Right Front Passenger Compartment Air Temperature	—	Varies	The scan tool displays the amount of heat in the air in the right front area of the interior cabin of the vehicle in Celsius (°C) or Fahrenheit (°F).
Right Rear HVAC Mode Status	—	Not Determined	The scan tool displays Not Determined, Off, Auto, Floor, Floor and Vent, Vent, Vent and Roof, Roof, Roof and Floor, or Floor and Vent and Roof. This parameter describes what state the heating, ventilation, air conditioning system is in for the rear right area of the vehicle cabin.
Sunload Sensor Voltage	—	Varies	The scan tool displays Volts. This is a sensor that detects how warm the sun is shining.
Windshield Temperature	—	Varies	The scan tool displays temperature in Celsius (°C) or Fahrenheit (°F). This parameter detects the temperature of the front window (windshield).

Body Control Module — HVAC System Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
A/C Compressor Refrigerant Solenoid Valve Command	—	Varies	The scan tool displays percentage (%).

Parameter	System State	Expected Value	Description
A/C Compressor Displacement	—	Ready	The scan tool displays Ready, Ramp up, Running, or Ramp down. A variable displacement air conditioning compressor has the ability to change the amount of refrigerant that is pumped into the system (output) while it is running by way of a pulse width modulated (PWM) solenoid. A PWM solenoid will vary the compressor output by using a DC supply voltage that is switched on and off at a given frequency for a modulated period of time (duty cycle). The duty cycle is the “on” time of the voltage and is expressed as a percentage of the time period. This parameter describes the condition in which a variable displacement air conditioning compressor is increasing displacement, holding steady, or decreasing displacement.
A/C Switch	—	Compressor Off	The scan tool displays Compressor Off, Compressor On, or Compressor In Econ. This parameter is used to indicate the status of the signal being sent to the Engine Control Module to turn the A/C on.
Air Quality Sensor	—	Varies	The scan tool displays percentage (%). This is a sensor that measures the amount of contamination, pollution, dirt, odor in the ambient air.
Air Quality Recirculation Control	—	Inactive	The scan tool displays Active or Inactive. The recirculation door in an air conditioning system has the ability to either allow fresh air into the vehicle or to pass the existing cabin air back through the air conditioning system. The recirculation door will be closed if the Air Quality Sensor detects oxidizing, reducing, or ammonia gasses and reopens the door when these gasses are no longer detected.
Auxiliary Blower Motor Speed Command	—	Varies	This parameter shows the value (counts) being sent to command the rear blower from the Auxiliary Blower switch on the front panel. This describes the rear blower motor for the HVAC system. This is supplemental to the primary blower fan.

Parameter	System State	Expected Value	Description
Auxiliary Coolant Pump	—	Inactive	The scan tool displays Active or Inactive. The Auxiliary Coolant Pump refers to a second engine cooling pump that may be devoted to a different function other than for purposes of engine cooling.
Auxiliary Coolant Pump Dry	—	Inactive	The scan tool displays Active or Inactive. This parameter contains the fault information that is communicated by the Electric Auxiliary Coolant Pump over Local Interconnect Network (LIN) to the engine controller. An electric coolant pump circulates engine coolant. This indicates whether the pump was operated without coolant.
Auxiliary Coolant Pump Internal Status	—	Inactive	The scan tool displays Active or Inactive. This parameter contains the fault information that is communicated by the Electric Auxiliary Coolant Pump over Local Interconnect Network (LIN) to the engine controller. An electric coolant pump circulates engine coolant. This indicates whether the pump indicates an internal error.
Auxiliary Coolant Pump Motor Stalled	—	Inactive	The scan tool displays Active or Inactive. This parameter contains the fault information that is communicated by the Electric Auxiliary Coolant Pump over Local Interconnect Network (LIN) to the engine controller. An electric coolant pump circulates engine coolant. This indicates whether the pump has stopped running.
Auxiliary Heater Enable Signal	—	Inactive	The scan tool displays Active or Inactive.
Blower Motor Feedback Signal	—	Varies	The scan tool displays percentage (%). The Blower Motor passes air through the heater core and circulates air throughout the passenger compartment. The Blower Motor is controlled by a module. This parameter indicates the Blower Motor operation Feedback Signal received by the module.
Blower Motor Speed	—	Varies	This parameter indicates the commanded HVAC Blower Motor Speed, displayed in percent, that the blower is turning. The blower motor is a motor with a cage attached to force the air through ducts such as heater, ventilation and defrost ducts.

Parameter	System State	Expected Value	Description
Blower Motor Speed Command	—	Varies	This parameter indicates the commanded HVAC Blower Motor Speed, displayed in percent, that the blower is turning. The blower motor is a motor with a cage attached to force the air through ducts such as heater, ventilation and defrost ducts.
Blower Motor Speed Feedback Signal	—	Normal Function	The scan tool displays Out of Range Low, Stall, Partial Stall, Voltage Out of Range, Normal Function, Motor Over Temperature, Not Used, Mechanical Malfunction, or Out of Range High. The Blower Motor passes air through the heater core and circulates air throughout the passenger compartment. The Blower Motor is controlled by a module. This parameter indicates the Blower Motor operation Feedback Signal received by the module.
Blower Motor Speed Request	—	—	This parameter shows the current state of the switch that turns on the front blower (device that produces a current of air).
Calculated A/C Evaporator Air Temperature	—	Varies	The scan tool displays temperature in Celsius (°C). This parameter indicates the calculated temperature (degrees of heat) of the air that is flowing through the evaporator. The temperature is calculated by the HVAC controller using parameters such as outside air temperature, evaporator temperature and compressor status. An evaporator is a device in a process used to turn the liquid form of a chemical substance into its gaseous-form/vapor.
Coolant Heater Control Module Inlet Coolant Temperature	—	Varies	The scan tool displays this parameter Identifier as a value between -40°C and 150°C approximately to reflect Inlet Coolant Temperature into Coolant Heater Control Module, reported by Coolant Heater Control Module.
Coolant Heater Control Module LIN Bus	—	True	The scan tool displays this parameter identifier as False or True. This parameter identifier is indicative of a Signal State of Coolant Heater Operation Enable from Electronic Climate Control to Coolant Heater Control Module on Local Interconnect Network Bus that allows Coolant Heater to Start Diagnostics whether or not Heating is commanded.

Parameter	System State	Expected Value	Description
Coolant Heater Control Module Status	—	Normal Function	The scan tool displays Normal Function, Temporarily Limited, Recoverable Malfunction, or Non-Recoverable Malfunction. This parameter is used to determine whether the Coolant Heater Control Module is operating normally (Normal Operation) or if there is a problem with a) the Coolant Heater Control Module (scan tool displays only Limited Operation) or b) there is a blockage or restriction in coolant flow (scan tool switches between Normal Running and Limited Operation).
Coolant Heater Control Module Temperature	—	Varies	The scan tool displays temperature in Celsius (°C). This is the temperature inside the coolant heater control module.
Coolant Heater Current	—	Varies	The scan tool displays the present electric current flow value of the coolant heater in amps.
Desired Engine Coolant Bypass Valve Position	—	Not Requested	The scan tool displays Not Requested, Bypass, or Connected. This parameter displays the requested target position of the Coolant Bypass Valve.
Engine Coolant Heater Command	—	Varies	The scan tool displays in kW. This is the serial data command to control the device to heat up the coolant in case the engine does not produce enough heat.
Front Blower Motor State	—	Varies	The scan tool displays Not Determined, Off, Auto, Manual, or Manual Max. This parameter indicates the current mode or condition of the front blower motor.
Heater Pump Speed	—	Varies	The scan tool displays the heater pump speed in RPM. This is a coolant pump which circulates heat through the heater core to maintain cabin temperature. While the vehicle is in Autostop, the pump can interrupt the Autosop timing, if the cabin temperature is too low.

Parameter	System State	Expected Value	Description
HVAC Afterblow	—	Inactive	The scan tool displays Active or Inactive. This parameter displays whether the afterblow function is in a functioning state or not. The afterblow function temporarily turns on the fan after the vehicle is off to dry the evaporator core which will reduce microbial growth and odors. An evaporator is a device in a process used to turn the liquid form of a chemical substance into its gaseous-form/vapor.
HVAC Afterblow - Blower Motor Speed	—	Varies	This parameter displays how fast the fan is running while in an afterblow condition. The fan speed is displayed as steps from 0 to 12 with 0 being off and 12 being the fastest speed. The afterblow function temporarily turns on the fan after the vehicle is off to dry the evaporator core which will reduce microbial growth and odors. An evaporator is a device in a process used to turn the liquid form of a chemical substance into its gaseous-form/vapor.
HVAC Afterblow Configuration	—	—	—
HVAC System Heater Core Coolant Flow Rate Feedback	—	Varies	The scan tool displays the coolant flowing rate in L/min. The HVAC System Heater Core contains coolant that flows though the core to heat the vehicle passenger compartment. The system is controlled by a module. This parameter indicates the coolant flow rate through the heater core requested by the module.
HVAC System Heater Core Coolant Flow Rate Request	—	Varies	The scan tool displays the coolant flowing rate in L/s. The HVAC System Heater Core contains coolant that flows though the core to heat the vehicle passenger compartment. The system is controlled by a module. This parameter indicates the coolant flow rate through the heater core requested by the module.
Rear Defogger Activated by Automatic	—	Yes	The Auto Rear Defogger (heating wires in the glass) can automatically activate if the ambient temperature is below 5°C. This parameter has the states Yes/No.
Rear Defogger Command	—	—	—
Rear Defogger Deactivation Reason	—	—	—
Rear Defogger Indicator	—	—	—
Rear Defogger Mode	—	—	—

Parameter	System State	Expected Value	Description
Rear Defogger On Time Remaining	—	—	—
Rear Defogger Relay Command	—	—	—
Rear Defogger Status	—	—	—
Rear Defogger Switch	—	—	—
Sun Azimuth	—	—	—
Sun Elevation	—	—	—

Body Control Module — HVAC Door Position Data 1 — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Air Recirculation Door Actuator Command	—	Varies	This is the serial data command to move the flap of the Recirculation Door, in counts or pulses, for a HVAC system door. Recirculation is using inside air for the HVAC system, instead of outside fresh air.
Left Temperature Door Position Command	—	Varies	The scan tool displays percentage (%). This is the serial data command to control the actual position (angle) of the flap that controls the air flow (and therefore the air temperature) through the left heater core.
Low Speed Pollution Taking Recirc Action	—	—	—

Body Control Module — HVAC Door Position Data 2 — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Right Temperature Door Position Command	—	Varies	The scan tool displays percentage (%). This is the serial data command to move the position (angle) of the flap that controls the air flow (and therefore the air temperature) through the right heater core.

Body Control Module — HVAC Faceplate Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Air Recirculation Door Position	—	Varies	The scan tool displays the command status of the HVAC control module recirculation switch: Not Determined, Auto, Fresh Air, or Recirc. The mode of recirculation means the air inside the vehicle is recirculated rather than drawn from outside.

Parameter	System State	Expected Value	Description
Air Quality Sensor Switch	—	Off	The scan tool displays Off, Low Sensitivity, or Hi Sensitivity. This parameter describes the switch state of the Air Quality Sensor on the HVAC Faceplate.
Auxiliary Blower Motor Switch	—	Off	The scan tool displays Not Determined, Off, Auto, Manual, or Manual Max. This parameter reflects the current state of the switch in the rear of the vehicle that controls the rear blower. This describes the rear blower motor for the HVAC system. This is supplemental to the primary blower fan.
Desired Left Temperature	—	Varies	The scan tool displays Temp Set Off, Temp Set Normal, Temp Set Low, or Temp Set Hi. This parameter displays the setting of left temperature.
Desired Right Temperature	—	Varies	The scan tool displays Temp Set Off, Temp Set Normal, Temp Set Low, or Temp Set Hi. This parameter displays the setting of right temperature.

Body Control Module — Hybrid/EV Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Coolant Heater Control Module Temperature	—	Varies	The scan tool displays temperature in Celsius (°C). This is the temperature inside the coolant heater control module.

Body Control Module — Indicator Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Child Security Lock Indicator command	—	Off	The scan tool displays On or Off.
Lane Departure Warning Indicator Status	—	Off	The scan tool displays On or Off.
Security Indicator Command	—	Off	The scan tool displays On or Off.

Body Control Module — Interior Lighting Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Cargo Lamp Command	—	Inactive	The scan tool displays Active or Inactive.
Cargo Lamp Indicator	—	Inactive	The scan tool displays Active or Inactive.

Parameter	System State	Expected Value	Description
Cargo Mirror Lamp	—	Inactive	The scan tool displays Active or Inactive.
Dome Lamp Command	—	Off	The scan tool displays On or Off.
Door Ambient Lighting Command	—	Off	The scan tool displays On or Off.
Front Courtesy Lamps	—	Inactive	The scan tool displays Active or Inactive.
Front Footwell Ambient Lighting Command	—	Off	The scan tool displays On or Off.
Instrument Panel Ambient Lighting Command	—	Off	The scan tool displays On or Off.
Interior Courtesy Lamps Command	—	Inactive	The scan tool displays Active or Inactive.
Left Turn Signal Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Turn Signal Switch	—	Inactive	The scan tool displays Active or Inactive.
Overhead Ambient Lighting Command	—	Off	The scan tool displays On or Off.
Park Lamps Indicator	—	Inactive	The scan tool displays Active or Inactive.
Rear Footwell Ambient Lighting Command	—	Off	The scan tool displays On or Off.
Welcome Lighting	—	Off	The scan tool displays On or Off.

Body Control Module — Keyless Entry Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Current Number of Key Fobs Programmed	—	Varies	This parameter indicates how many transmitters have been learned to the Body Control Module currently.
Key Fob Identifier	—	Varies	This parameter refers to the part number of key fob or transmitter being placed in the backup pocket location that uses the radio transmitter inside a vehicle key used to control the central door locking via button presses.
Key Fob 1 Malfunction	—	No	The scan tool displays Yes or No. This parameter indicates a fault in transmitter # 1.
Key Fob 2 Malfunction	—	No	The scan tool displays Yes or No. This parameter indicates a fault in transmitter # 2.
Key Fob 3 Malfunction	—	No	The scan tool displays Yes or No. This parameter indicates a fault in transmitter # 3.
Key Fob 4 Malfunction	—	No	The scan tool displays Yes or No. This parameter indicates a fault in transmitter # 4.

Parameter	System State	Expected Value	Description
Key Fob 5 Malfunction	—	No	The scan tool displays Yes or No. This parameter indicates a fault in transmitter # 5.
Key Fob 6 Malfunction	—	No	The scan tool displays Yes or No. This parameter indicates a fault in transmitter # 6.
Key Fob 7 Malfunction	—	No	The scan tool displays Yes or No. This parameter indicates a fault in transmitter # 7.
Key Fob 8 Malfunction	—	No	The scan tool displays Yes or No. This parameter indicates a fault in transmitter # 8.
Number of Key Fobs Learned	—	Varies	This parameter indicates how many transmitters have been programmed to the Keyless Entry Control Module.
Total Key Fobs Erased	—	Off	This parameter indicates the number of transmitters erased from the Body Control Module memory.
Passive Entry Disabled Due to Lack of Motion Counter	—	Varies	This parameter indicates the count value of the passive entry inhibited due to no key fob or transmitter movement.
Passive Start Disabled Due to Excessive Motion Counter	—	Varies	This parameter indicates the count value of the passive start inhibited due to large key fob or transmitter movement.
Passive Start Diabled Due to Lack of Motion Counter	—	Varies	This parameter indicates the count value of the passive start inhibited due to no key fob or transmitter movement.

Body Control Module — Outside Rear View Mirror Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Mirror Folding	—	Inactive	The scan tool displays Inactive, Fold, or Unfold.
Mirror Select Switch	—	Not Active	The scan tool displays Active or Inactive.

Body Control Module — Power Mode Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Accessory/Retained Accessory Power Relay Command	—	Inactive	The scan tool displays Active or Inactive.
Backup Run/Crank Relay Command	—	Inactive	The scan tool displays Active or Inactive.
Backup System Power Mode	—	Off	The scan tool displays Off, Accessory, Run, Start, or Propulsion Active. This parameter indicates Power Mode determined by Serial Data Gateway Module.

Parameter	System State	Expected Value	Description
Battery Saver Mode	—	Off	The scan tool displays Off, Assembly Plant Mode, Transport Mode, or Storage Mode.
Ignition Switch Status	—	Varies	The scan tool displays Short to Ground, Active, Inactive, or Open/Short to Battery.
Power Mode	—	Varies	The scan tool displays Off, Accessory, Run, Start, or Propulsion Active. This parameter indicates the current power mode of the module.
Power Mode Timeout	—	Disable	The scan tool displays Enable or Disable. This parameter disables or enables the power mode timeout function (not whether timer is active or inactive) and indicates whether or not the power mode timeout function has been disabled allowing to stay in power mode indefinitely (not whether timer is active or inactive).
Run/Crank Relay Command	—	Inactive	The scan tool displays Active or Inactive.
Run Relay Command	—	Inactive	The scan tool displays Active or Inactive.

Body Control Module — Rear Exterior Lighting Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Backup Lamps	—	Off	The scan tool displays On or Off.
Center High Mounted Stop Lamp	—	Off	The scan tool displays On or Off.
Hands-Free Liftgate Sensor Lamp	—	Off	The scan tool displays On or Off.
Left Stop Lamp Command	—	Off	The scan tool displays On or Off.
Right Stop Lamp Command	—	Off	The scan tool displays On or Off.
Left Tail Lamp	—	Off	The scan tool displays On or Off.
Right Tail Lamp	—	Off	The scan tool displays On or Off.
Left Auxiliary Tail Lamp	—	Off	The scan tool displays On or Off.
Right Auxiliary Tail Lamp	—	Off	The scan tool displays On or Off.
Left Rear Turn Signal Lamp Command	—	Off	The scan tool displays On or Off.
Right Rear Turn Signal Lamp Command	—	Off	The scan tool displays On or Off.
Left Trailer Turn Signal/Stop Lamp Command	—	Off	The scan tool displays On or Off.

Parameter	System State	Expected Value	Description
Right Trailer Turn Signal/Stop Lamp Command	—	Off	The scan tool displays On or Off.
License Plate Lamps Command	—	Off	The scan tool displays On or Off.
Rear Fog Lamp Command	—	Off	The scan tool displays On or Off.
Tail Lamps	—	Off	The scan tool displays On or Off.
Trailer Backup Lamps Command	—	Off	The scan tool displays On or Off.

Body Control Module — Rear HVAC Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Lower Rear Duct Temperature	—	Varies	The scan tool displays temperature in Celsius (°C). This is the temperature reading in the HVAC air routing system.
Upper Rear Duct Temperature	—	Varies	The scan tool displays temperature in Celsius (°C). This is the temperature reading in the HVAC air routing system.

Body Control Module — Remote Vehicle Start Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Engine Stalled During Remote Vehicle Start Mode	—	Varies	This parameter indicates the number of times the engine was stalled or unexpectedly stops running. This is part of the Remote Vehicle Start subsystem that disables remote start.
Park Lamps Request	—	No	The scan tool displays Yes or No. This parameter refers to the state (on or off) of the electronic request to illuminate the lamps located on the exterior four corners of the vehicle.
Remote Vehicle Start Disabled By Driver	—	Varies	This parameter determines if remote vehicle start was turned off by the driver. Remote start is activated by pressing a button on the key fob which allows the engine to start when the key fob is several yards from the vehicle.
Remote Vehicle Start Request	—	No	The scan tool displays Yes or No. This parameter displays the On / Off position or status for the remote start functionality.

Parameter	System State	Expected Value	Description
Remote Vehicle Start Source	—	None	The scan tool displays None, Key Fob 1, Key Fob 2, Key Fob 3, Enhanced Services, or Virtual Key. This parameter indicates which key fob was used for Remote Vehicle Start such as husband, wife, child, Onstar, bluetooth, etc...
Remote Vehicle Start Status	—	Inactive	The scan tool displays Yes or No. This parameter indicates the state of remote start which is activated by pressing a button on the key fob which allows the engine to start when the key fob is several yards from the vehicle. States are active or inactive.
Remote Vehicle Start Timer	—	Varies	This parameter indicates the amount of time the engine will run after a remote start request. One additional request is allowed which will reset the timer once. The scan tool displays time remaining in seconds.
Run/Crank Relay Command	—	None	The scan tool displays None, Active, or Deactive. This parameter indicates the state (off or on) of command for an ignition relay control circuit. "Run" means engine is started and keeps going, and "crank" engages the starter when the key in the ignition switch turns making engine turn over.
Turn Signal Lamps Request	—	No	The scan tool displays Yes or No. This parameter indicates the request for the turn signal lamps to flash during a remote start request and remain on for visual confirmation the remote start is functioning.

Body Control Module — Remote Vehicle Start Disable History Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Remote Vehicle Start Disable History 1	—	Varies	The scan tool displays Valet Mode, Run Abort, Ignition Switch Status, Hood Open Switch Signal Invalid, Hood Open Switch, Hazard Lamps Switch, Key Fob in Vehicle, Crank Abort, Brake Transmission Shift Interlock Solenoid Actuator, Content Theft Deterrent Mode, Power Mode Incorrect, Battery Voltage, Remote Vehicle Start Crank Time, or Folding Top Position. This parameter indicates one of the last eight reasons the powertrain has disabled the remote vehicle start.

Parameter	System State	Expected Value	Description
Remote Vehicle Start Disable History 2	—	Varies	The scan tool displays Valet Mode, Run Abort, Ignition Switch Status, Hood Open Switch Signal Invalid, Hood Open Switch, Hazard Lamps Switch, Key Fob in Vehicle, Crank Abort, Brake Transmission Shift Interlock Solenoid Actuator, Content Theft Deterrent Mode, Power Mode Incorrect, Battery Voltage, Remote Vehicle Start Crank Time, or Folding Top Position. This parameter indicates one of the last eight reasons the powertrain has disabled the remote vehicle start.
Remote Vehicle Start Disable History 3	—	Varies	The scan tool displays Valet Mode, Run Abort, Ignition Switch Status, Hood Open Switch Signal Invalid, Hood Open Switch, Hazard Lamps Switch, Key Fob in Vehicle, Crank Abort, Brake Transmission Shift Interlock Solenoid Actuator, Content Theft Deterrent Mode, Power Mode Incorrect, Battery Voltage, Remote Vehicle Start Crank Time, or Folding Top Position. This parameter indicates one of the last eight reasons the powertrain has disabled the remote vehicle start.

Body Control Module — Seat Heating/Venting/Cooling Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Seat Heating/Venting/Cooling Load Shed	—	Inactive	The scan tool displays Active or Inactive. When this parameter is active, it indicates the Heating/Venting/Cooling system is shutdown to reduce strain on the vehicle electrical system which is experiencing too high of a current draw.
Left Front Seat Heating/Venting/Cooling Operating Conditions	—	Varies	The scan tool displays Remote Vehicle Start, Automatic, Manual, or Autostop Request. The functional behavior of heated seats is dependent on its determined operational state. This parameter indicates the defined state which it is operating in.

Parameter	System State	Expected Value	Description
Left Front Seat Heating/ Venting/Cooling Requested Mode	—	Varies	The scan tool displays Off, Seat Back Heating, Seat Back and Cushion Heating, or Seat Venting/Cooling. This parameter indicates the type of Heated/Vented Seat function being requested, as determined by the Body Control Module tracking various inputs.
Left Front Seat Heating/ Venting/Cooling Requested Level	—	Varies	The scan tool displays Off, High, Medium, or Low. This parameter indicates the type of Heated/Vented Seat level of intensity being requested as determined by the Body Control Module tracking various inputs.
Left Front Seat Heating/ Venting/Cooling Mode	—	Varies	The scan tool displays Off, Seat Back Heating, Seat Back and Cushion Heating, or Seat Venting/Cooling. This parameter indicates the type of Heated/Vented Seat function being applied as commanded by the Body Control Module software based on a number of factors.
Left Front Seat Heating/ Venting/Cooling Level	—	Varies	The scan tool displays Off, High, Medium, or Low. This parameter indicates the type of Heated/Vented Seat level of intensity being applied as commanded by the Body Control Module software based on a number of factors.
Left Front Seat Blower Command	—	Inactive	The scan tool displays Active or Inactive. This parameter can be used for setting various blower speeds but service tool will only turn on high to verify module outputs and fan operation.
Right Front Seat Heating/ Venting/Cooling Operating Conditions	—	Varies	The scan tool displays Remote Vehicle Start, Automatic, Manual, or Autostop Request. The functional behavior of heated seats is dependent on its determined operational state. This parameter indicates the defined state which it is operating in.
Right Front Seat Heating/ Venting/Cooling Requested Mode	—	Varies	The scan tool displays Off, Seat Back Heating, Seat Back and Cushion Heating, or Seat Venting/Cooling. This parameter indicates the type of Heated/Vented Seat function being requested, as determined by the Body Control Module tracking various inputs.

Parameter	System State	Expected Value	Description
Right Front Seat Heating/ Venting/Cooling Requested Level	—	Varies	The scan tool displays Off, High, Medium, or Low. This parameter indicates the type of Heated/Vented Seat level of intensity being requested as determined by the Body Control Module tracking various inputs.
Right Front Seat Heating/ Venting/Cooling Mode	—	Varies	The scan tool displays Off, Seat Back Heating, Seat Back and Cushion Heating, or Seat Venting/Cooling. This parameter indicates the type of Heated/Vented Seat function being applied as commanded by the Body Control Module software based on a number of factors.
Right Front Seat Heating/ Venting/Cooling Level	—	Varies	The scan tool displays Off, High, Medium, or Low. This parameter indicates the type of Heated/Vented Seat level of intensity being applied as commanded by the Body Control Module software based on a number of factors.
Right Front Seat Blower Command	—	Inactive	The scan tool displays Active or Inactive. This parameter can be used for setting various blower speeds but service tool will only turn on high to verify module outputs and fan operation.

Body Control Module — Sunroof Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Sunroof Closed	—	Yes	The scan tool displays Yes or No. This parameter indicates that sunroof is not open. The sunroof is a fixed or operable opening in an automobile roof which allows light and/or fresh air to enter the passenger compartment.
Sunroof Open	—	Yes	The scan tool displays Yes or No. This parameter indicates the sunroof state that it is not closed. The sunroof is a fixed or operable opening in an automobile roof which allows light and/or fresh air to enter the passenger compartment.
Sunroof Switch	—	Varies	The scan tool displays Inactive, Open, Close, or Stop. This is the switch to move the sunroof.
Sunroof Switch Fault	—	Varies	The scan tool displays Short to Ground, Short to Battery, Stuck, or None.

Parameter	System State	Expected Value	Description
Sunroof Not Learned	—	No	The scan tool displays Yes or No. This parameter indicates that the control module has not learned the sunroof (the glass) home position.
Sunroof Motor Overtemperature	—	No	The scan tool displays Yes or No. This parameter indicates that the motor that operates the sunroof motor is too hot to operate properly.
Sunroof Obstruction	—	No	The scan tool displays Yes or No. This parameter indicates that an obstruction is detected which prevents the movement of the sunroof.
Sunroof System Voltage Low	—	No	The scan tool displays Yes or No. This parameter indicates the sunroof performance is degraded due to voltage being below a certain threshold.
Sunroof Vent	—	No	The scan tool displays Yes or No. This parameter indicates the sunroof is partially open.
Sunshade Closed	—	Yes	The scan tool displays Yes or No.
Sunshade Open	—	Yes	The scan tool displays Yes or No.
Sunshade Switch	—	Varies	The scan tool displays Inactive, Open, Close, or Stop. This is the switch to move the sunshade (the non-transparent cover below the sunroof).
Sunshade Switch Fault	—	Varies	The scan tool displays Short to Ground, Short to Battery, Stuck, or None.
Sunshade Not Learned	—	No	The scan tool displays Yes or No. This parameter indicates that the sunshade position is not learned.
Sunshade Motor Overtemperature	—	Inactive	The scan tool displays Active or Inactive. This parameter indicates that the motor that operates the sunshade is too hot to operate properly.
Sunshade Obstruction	—	No	The scan tool displays Yes or No. This parameter indicates that an obstruction is detected which prevents the movement of the sunshade.
Sunshade System Voltage Low	—	No	The scan tool displays Yes or No. This parameter indicates that the sunshade performance is degraded due to voltage being below a certain threshold.

Body Control Module — Tire Pressure Monitoring Sensor Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Left Front Tire Pressure Sensor Identification	—	Varies	This parameter refers to the part number of the electronic device that measures the force of air on the interior surface of the left, front tire.
Left Front Tire Pressure Sensor Battery Status	—	Normal	The scan tool displays Normal or Low Pressure. This parameter displays the state of the power supply (battery) for the left front tire pressure sensor which is an electronic device that measures the force of air on the interior surface of the tire.
Left Front Tire Pressure Sensor Status	—	Varies	This parameter will display different types of sensor faults. The tire pressure sensors are mounted inside a tire assembly on valve stems or wheel rims.
Left Front Tire Pressure Sensor Signal Strength	—	Varies	The tire pressure monitoring system detects a pressure loss at the tires. Each wheel is equipped with a pressure sensor to measure the pressure and temperature. This parameter displays the signal strength of the sensor.
Left Front Tire Pressure Signal Frame Count	—	Varies	This is the number of data frames the tire pressure sensor is transmitting while driving.
Left Front Tire Pressure Signal Packet Count	—	Varies	This is the number of packet counts the tire pressure sensor is transmitting while driving.
Left Rear Tire Pressure Sensor Identification	—	Varies	This parameter refers to the part number of the electronic device that measures the force of air on the interior surface of the left, rear tire.
Left Rear Tire Pressure Sensor Battery Status	—	Normal	The scan tool displays Normal or Low Pressure. This parameter displays the state of the power supply (battery) for the left rear tire pressure sensor which is an electronic device that measures the force of air on the interior surface of the tire.
Left Rear Tire Pressure Sensor Status	—	Varies	This parameter will display different types of sensor faults. The tire pressure sensors are mounted inside a tire assembly on valve stems or wheel rims.

Parameter	System State	Expected Value	Description
Left Rear Tire Pressure Sensor Signal Strength	—	Varies	The tire pressure monitoring system detects a pressure loss at the tires. Each wheel is equipped with a pressure sensor to measure the pressure and temperature. This parameter displays the signal strength of the sensor.
Left Rear Tire Pressure Signal Frame Count	—	Varies	This is the number of data frames the tire pressure sensor is transmitting while driving.
Left Rear Tire Pressure Signal Packet Count	—	Varies	This is the number of packet counts the tire pressure sensor is transmitting while driving.
Right Front Tire Pressure Sensor Identification	—	Varies	This parameter will display the six digit identification number of the sensor indicated which is an electronic device that measures the force of air on the interior surface of the tire.
Right Front Tire Pressure Sensor Battery Status	—	Normal	The scan tool displays Normal or Low Pressure. This parameter displays the state of the power supply (battery) for the right front tire pressure sensor which is an electronic device that measures the force of air on the interior surface of the tire.
Right Front Tire Pressure Sensor Status	—	Varies	This parameter will display different types of sensor faults. The tire pressure sensors are mounted inside a tire assembly on valve stems or wheel rims.
Right Front Tire Pressure Sensor Signal Strength	—	Varies	The tire pressure monitoring system detects a pressure loss at the tires. Each wheel is equipped with a pressure sensor to measure the pressure and temperature. This parameter displays the signal strength of the sensor.
Right Front Tire Pressure Signal Frame Count	—	Varies	This is the number of data frames the tire pressure sensor is transmitting while driving.
Right Front Tire Pressure Signal Packet Count	—	Varies	This is the number of packet counts the tire pressure sensor is transmitting while driving.
Right Rear Tire Pressure Sensor Identification	—	Varies	This parameter will display the six digit identification number of the sensor indicated which is an electronic device that measures the force of air on the interior surface of the tire.

Parameter	System State	Expected Value	Description
Right Rear Tire Pressure Sensor Battery Status	—	Normal	The scan tool displays Normal or Low Pressure. This parameter displays the state of the power supply (battery) for the right rear tire pressure sensor which is an electronic device that measures the force of air on the interior surface of the tire.
Right Rear Tire Pressure Sensor Status	—	Varies	This parameter will display different types of sensor faults. The tire pressure sensors are mounted inside a tire assembly on valve stems or wheel rims.
Right Rear Tire Pressure Sensor Signal Strength	—	Varies	The tire pressure monitoring system detects a pressure loss at the tires. Each wheel is equipped with a pressure sensor to measure the pressure and temperature. This parameter displays the signal strength of the sensor.
Right Rear Tire Pressure Signal Frame Count	—	Varies	This is the number of data frames the tire pressure sensor is transmitting while driving.
Right Rear Tire Pressure Signal Packet Count	—	Varies	This is the number of packet counts the tire pressure sensor is transmitting while driving.

Body Control Module — Tire Pressure Monitoring System Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Left Front Tire Pressure	—	Varies	Tire pressure is a measure of the amount of air in a vehicle's tires, in pounds per square inch (PSI). This parameter is the amount of pressure present in the front of the vehicle on the left side.
Left Front Tire Pressure Sensor Mode	—	Varies	The scan tool displays Learn Mode - Remotely Triggered, Undefined, Re-Measure, Drive Mode, Power Down, Wake-Up, or Learn Mode - Pressure Triggered. This parameter refers to the operational level of the electronic device that measures the force of air on the interior surface of the left front tire.
Left Front Tire Pressure Status	—	Varies	The scan tool displays Unknown, Nominal, Very Low Pressure, Low, Weak Signal, or High. This parameter indicates the state of the tire based on tire pressure.

Parameter	System State	Expected Value	Description
Left Front Tire Temperature	—	Varies	The tire pressure monitoring system detects a pressure loss at the tires. Each wheel is equipped with a pressure sensor to measure the pressure and temperature. This parameter displays the temperature of the tire.
Left Rear Tire Pressure	—	Varies	Tire pressure is a measure of the amount of air in a vehicle's tires, in pounds per square inch (PSI). This parameter is the amount of pressure present in the rear of the vehicle on the left side.
Left Rear Tire Pressure Sensor Mode	—	Varies	The scan tool displays Learn Mode - Remotely Triggered, Undefined, Re-Measure, Drive Mode, Power Down, Wake-Up, or Learn Mode - Pressure Triggered. This parameter refers to the operational level of the electronic device that measures the force of air on the interior surface of the left rear tire.
Left Rear Tire Pressure Status	—	Varies	The scan tool displays Unknown, Nominal, Very Low Pressure, Low, Weak Signal, or High. This parameter identifies status of left rear tire pressure.
Left Rear Tire Temperature	—	Varies	The tire pressure monitoring system detects a pressure loss at the tires. Each wheel is equipped with a pressure sensor to measure the pressure and temperature. This parameter displays the temperature of the tire.
Right Front Tire Pressure	—	Varies	Tire pressure is a measure of the amount of air in a vehicle's tires, in pounds per square inch (PSI). This parameter is the amount of pressure present in the front of the vehicle on the right side.
Right Front Tire Pressure Sensor Mode	—	Varies	The scan tool displays Learn Mode - Remotely Triggered, Undefined, Re-Measure, Drive Mode, Power Down, Wake-Up, or Learn Mode - Pressure Triggered. This parameter refers to the operational level of the electronic device that measures the force of air on the interior surface of the right front tire.
Right Front Tire Pressure Status	—	Varies	The scan tool displays Unknown, Nominal, Very Low Pressure, Low, Weak Signal, or High. This parameter indicates the state of the tire based on tire pressure.

Parameter	System State	Expected Value	Description
Right Front Tire Temperature	—	Varies	The tire pressure monitoring system detects a pressure loss at the tires. Each wheel is equipped with a pressure sensor to measure the pressure and temperature. This parameter displays the temperature of the tire.
Right Rear Tire Pressure	—	Varies	Tire pressure is a measure of the amount of air in a vehicle's tires, in pounds per square inch (PSI). This parameter is the amount of pressure present in the rear of the vehicle on the right side.
Right Rear Tire Pressure Sensor Mode	—	Varies	The scan tool displays Learn Mode - Remotely Triggered, Undefined, Re-Measure, Drive Mode, Power Down, Wake-Up, or Learn Mode - Pressure Triggered. This parameter refers to the operational level of the electronic device that measures the force of air on the interior surface of the right rear tire.
Right Rear Tire Pressure Status	—	Varies	The scan tool displays Unknown, Nominal, Very Low Pressure, Low, Weak Signal, or High. This parameter indicates the state of the tire based on tire pressure.
Right Rear Tire Temperature	—	Varies	The tire pressure monitoring system detects a pressure loss at the tires. Each wheel is equipped with a pressure sensor to measure the pressure and temperature. This parameter displays the temperature of the tire.
Last Tire Fill Alert Notification	—	Varies	The scan tool displays Left Rear Inner, Left Rear Outer, Right Rear Outer, Left Front, Right Rear Inner, Spare, Unknown, or Right Front. Tire Fill Alert is a software feature that indicates when a predetermined pressure level is reached performed on the last tire.
Tire Fill Alert System State - Current	—	Varies	The scan tool displays Non Monitor, Monitoring, Active, or Achieved. Tire Fill Alert is software feature in the Tire Pressure Module system. Basically, the Tire Pressure Module system enables the High Pressure Warnings when the air pressure level goes higher than target pressure level. This parameter indicates the immediate status of the system in the present power cycle.

Parameter	System State	Expected Value	Description
Tire Fill Alert System State - Previous	—	Varies	The scan tool displays Non Monitor, Monitoring, Active, or Achieved. Tire Fill Alert is software feature in the Tire Pressure Module System. Basically, the Tire Pressure Module system enables the High Pressure Warnings when the air pressure level goes higher than target pressure level. This parameter indicates the status in the former power cycle.
Self Auto Learn Status - Left Front Sensor	—	Inactive	The scan tool displays Active or Inactive. For vehicles with Self Auto Learn capable sensors, this parameter is used to define transmission during rolling Self Auto Learn state. A value of 1 means Self Auto Learn rolling state is Active and a value of 0 sets for all other non Self Auto Learn transmissions.
Self Auto Learn Status - Left Rear Sensor	—	Inactive	The scan tool displays Active or Inactive. For vehicles with Self Auto Learn capable sensors, this parameter is used to define transmission during rolling Self Auto Learn state. A value of 1 means Self Auto Learn rolling state is Active and a value of 0 sets for all other non Self Auto Learn transmissions.
Self Auto Learn Status - Right Front Sensor	—	Inactive	The scan tool displays Active or Inactive. For vehicles with Self Auto Learn capable sensors, this parameter is used to define transmission during rolling Self Auto Learn state. A value of 1 means Self Auto Learn rolling state is Active and a value of 0 sets for all other non Self Auto Learn transmissions.
Self Auto Learn Status - Right Rear Sensor	—	Inactive	The scan tool displays Active or Inactive. For vehicles with Self Auto Learn capable sensors, this parameter is used to define transmission during rolling Self Auto Learn state. A value of 1 means Self Auto Learn rolling state is Active and a value of 0 sets for all other non Self Auto Learn transmissions.

Body Control Module — Windows Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
All Windows Up/Down	—	Close	The scan tool displays Open or Close.
Driver Window Learned	—	Yes	The scan tool displays Yes or No.

Parameter	System State	Expected Value	Description
Driver Window Motor Relay Fault Status	—	OK	This scan tool displays OK or Malfunction.
Left Front Window Express Down	—	Inactive	The scan tool displays Active or Inactive.
Left Front Window Express Up	—	Inactive	The scan tool displays Active or Inactive.
Left Front Window Learned Indicator	—	Not Active	The scan tool displays Active or Not Active.
Left Front Window Lockout Status	—	Inactive	The scan tool displays Active or Inactive.
Left Front Window Motor Current	—	Varies	The scan tool displays left front window motor current in amperes (A).
Left Front Window Switch	—	Inactive	The scan tool displays Inactive, Up, Express Up, Down, Express Down, or Stop.
Left Rear Window Express Up	—	Inactive	The scan tool displays Active or Inactive.
Left Rear Window Express Down	—	Inactive	The scan tool displays Active or Inactive.
Left Rear Window Learned	—	Yes	The scan tool displays Yes or No.
Left Rear Window Learned Indicator	—	Not Active	The scan tool displays Active or Not Active.
Left Rear Window Lockout Status	—	Inactive	The scan tool displays Active or Not Active.
Left Rear Window Motor Current	—	Varies	The scan tool displays left rear window motor current in amperes (A).
Left Rear Window Motor Relay Fault Status	—	OK	This scan tool displays OK or Malfunction.
Left Rear Window Switch	—	Inactive	The scan tool displays Inactive, Up, Express Up, Down, Express Down, or Stop.
Passenger Window Learned	—	Yes	The scan tool displays Yes or No.
Passenger Window Motor Relay Fault Status	—	OK	This scan tool displays OK or Malfunction.
Right Front Window Express Up	—	Inactive	The scan tool displays Active or Inactive.
Right Front Window Express Down	—	Inactive	The scan tool displays Active or Inactive.
Right Front Window Learned Indicator	—	Not Active	The scan tool displays Active or Not Active.
Right Front Window Lockout Status	—	Inactive	The scan tool displays Active or Inactive.
Right Front Window Motor Current	—	Varies	The scan tool displays right front window motor current in amperes (A).
Right Front Window Switch	—	Inactive	The scan tool displays Inactive, Up, Express Up, Down, Express Down, or Stop.
Right Rear Window Express Up	—	Inactive	The scan tool displays Active or Inactive.

Parameter	System State	Expected Value	Description
Right Rear Window Express Down	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Window Learned	—	Yes	The scan tool displays Yes or No.
Right Rear Window Learned Indicator	—	Not Active	The scan tool displays Active or Not Active.
Right Rear Window Lockout Status	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Window Motor Current	—	Varies	The scan tool displays right rear window motor current in amperes (A).
Right Rear Window Motor Relay Fault Status	—	OK	This scan tool displays OK or Malfunction.
Right Rear Window Switch	—	Inactive	The scan tool displays Inactive, Up, Express Up, Down, Express Down, or Stop.
Window Lockout Indicator	—	Inactive	The scan tool displays Active or Inactive.

Body Control Module — Wiper/Washer Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Windshield Washer Switch	—	Off	This parameter is used to display the state of the windshield washer switch. The states are On or Off. This is the electrical connection that controls the input to the motor that causes washer fluid to be dispensed on the front windshield.
Windshield Wiper Switch	—	Off	The scan tool displays Off, Sensitivity 1, Sensitivity 2, Sensitivity 3, Sensitivity 4, Sensitivity 5, Low, or High. This is the electrical connection that controls the input to the motor that causes movement of the wiper arm to clear the front windshield.
Windshield Wiper Mode	—	Varies	The scan tool displays Low, High, Delay 1, Delay 2, Delay 3, Delay 4, Delay 5, Suspended Due to Engine Crank, Parked, Service Park, Depressed Park, or Winter Park. This parameter displays the windshield wiper mode status.
Windshield Wiper Auto Mode Switch	—	—	—
Windshield Wiper Motor Protection Mode	—	—	—

Body Control Module — Tire Pressure Monitoring System Data – Front — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Selected Front Tire Type	—	Standard Load	The scan tool displays No Tire Type, Standard Load, Extra Load, Load Range C, Load Range D, or Load Range E. This parameter displays the front tire type.
Front Tire Pressure on Placard	—	Varies	This parameter reads the tire pressures selected for the front of the vehicle during programming / vehicle setup. Placard is the label printed on the driver side door. The recommended tire inflation pressures are listed on that label. The purpose of this parameter is to monitor for vehicles which have for some reason cleared the placard values to zero.
Front Tire Pressure on Placard (Eco)	—	Varies	This parameter shows the tire pressure printed on the label (placard) in the driver side door. There are 3 pressures given on the label for Comfort, Eco, Fully Loaded.
Front Tire Pressure on Placard (Comfort)	—	Varies	This parameter shows the tire pressure printed on the label (placard) in the driver side door. There are 3 pressures given on the label for Comfort, Eco, Fully Loaded.
Front Tire Pressure on Placard (Fully Loaded)	—	Varies	This parameter shows the tire pressure printed on the label (placard) in the driver side door. There are 3 pressures given on the label for Comfort, Eco, Fully Loaded.
Tire Pressure Monitoring System Regulation Type	—	Varies	The scan tool displays FMVSS, China, ECER64, or None. The Tire Pressure Monitoring System can be built to follow different legal standards. This parameter shows the name of the regulation (law giving entity), like Federal Motor Vehicle Safety Standards or Economic Comission for Europe.

Body Control Module — Tire Pressure Monitoring System Data – Rear — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Selected Rear Tire Type	—	Standard Load	The scan tool displays No Tire Type, Standard Load, Extra Load, Load Range C, Load Range D, or Load Range E. This parameter is used to display the type of tire selected (Load Range) for rear of the vehicle. The load range of the tire is generally how much weight or load the tire is capable performing.
Rear Tire Pressure on Placard	—	Varies	This parameter reads the tire pressures selected for the rear of the vehicle during programming / vehicle setup. Placard is the label printed on the driver side door. The recommended tire inflation pressures are listed on that label. The purpose of this parameter is to monitor for vehicles which have for some reason cleared the placard values to zero.
Rear Tire Pressure on Placard (Eco)	—	Varies	This parameter shows the tire pressure printed on the label (placard) in the driver side door. There are 3 pressures given on the label for Comfort, Eco, Fully Loaded.
Rear Tire Pressure on Placard (Comfort)	—	Varies	This parameter shows the tire pressure printed on the label (placard) in the driver side door. There are 3 pressures given on the label for Comfort, Eco, Fully Loaded.
Rear Tire Pressure on Placard (Fully Loaded)	—	Varies	This parameter shows the tire pressure printed on the label (placard) in the driver side door. There are 3 pressures given on the label for Comfort, Eco, Fully Loaded.
Tire Pressure Monitoring System Regulation Type	—	Varies	The scan tool displays FMVSS, China, ECER64, or None. The Tire Pressure Monitoring System can be built to follow different legal standards. This parameter shows the name of the regulation (law giving entity), like Federal Motor Vehicle Safety Standards or Economic Comission for Europe.

Body Control Module — Vehicle Access Data — Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Child Security Lock - Lock Command	—	Inactive	The scan tool displays Inactive or Lock.

Parameter	System State	Expected Value	Description
Child Security Lock - Unlock Command	—	Inactive	The scan tool displays Inactive or Unlock.
Driver Door Open Switch	—	Inactive	This scan tool displays Active or Inactive.
Fuel Fill Door Lock	—	Inactive	The scan tool displays Inactive or Lock.
Fuel Fill Door Unlock	—	Inactive	The scan tool displays Inactive or Unlock.
Glove Box Unlatch Switch	—	Locked	The scan tool displays Locked or Unlocked.
Left Front Door Ajar Switch	—	Inactive	The scan tool displays Active or Inactive.
Left Front Door Lock Command	—	Inactive	The scan tool displays Inactive or Lock.
Left Front Door Lock Indicator Command	—	Off	The scan tool displays On or Off.
Left Front Door Lock Switch	—	Inactive	The scan tool displays Active or Inactive.
Left Front Door Unlock Command	—	Inactive	The scan tool displays Inactive or Unlock.
Left Rear Door Ajar Switch	—	Inactive	The scan tool displays Active or Inactive.
Left Rear Door Lock Command	—	Inactive	The scan tool displays Inactive or Lock.
Left Rear Door Lock Indicator Command	—	Off	The scan tool displays On or Off.
Left Rear Door Unlock Command	—	Inactive	The scan tool displays Inactive or Unlock.
Passenger Door Open Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Front Door Ajar Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Front Door Lock Command	—	Inactive	The scan tool displays Inactive or Lock.
Right Front Door Lock Indicator Command	—	Off	The scan tool displays On or Off.
Right Front Door Unlock Command	—	Inactive	The scan tool displays Inactive or Unlock.
Right Rear Door Ajar Switch	—	Inactive	The scan tool displays Active or Inactive.
Right Rear Door Lock Command	—	Inactive	The scan tool displays Inactive or Lock.
Right Rear Door Lock Indicator Command	—	Off	The scan tool displays On or Off.
Rear Door Unlock Indicator Command	—	Off	The scan tool displays On or Off.
Right Rear Door Unlock Command	—	Inactive	The scan tool displays Inactive or Unlock.
Rear Closure Release	—	Inactive	The scan tool displays Inactive or Unlock.
Rear Closure Lock Command	—	Inactive	The scan tool displays Inactive or Lock.
Rear Closure Unlock Command	—	Inactive	The scan tool displays Inactive or Unlock.

Parameter	System State	Expected Value	Description
Theft Deterrent Lock Command	—	Inactive	The scan tool displays Inactive or Lock.
Theft Deterrent Unlock Command	—	Inactive	The scan tool displays Inactive or Unlock.

Body Control Module — Content Theft Deterrent Alarm Trigger — Scan Tool Output Controls

Output Control	Description
Horn Relay Command	This output control refers to a request to initiate the sound for a vehicle's loud warning signal. This output control is used to command the horn relay on and off.

Body Control Module — Exterior Lighting — Scan Tool Output Controls

Output Control	Description
Center High Mounted Stop Lamp	This output control is used to activate the center high mounted stop lamp when selecting On. The center high mounted stop lamp should illuminate until commanded Off.
Left Stop Lamp	This output control is used to activate the left stop lamp when selecting On. The left stop lamp should illuminate until commanded Off.
Right Stop Lamp	This output control is used to activate the right stop lamp when selecting On. The right stop lamp should illuminate until commanded Off.
License Plate Lamps	This output control is used to activate the license plate lamps when selecting On. The license plate lamps should illuminate until commanded Off.
Backup Lamps	This output control is used to activate the backup lamps when selecting On. The backup lamps should illuminate until commanded Off.
Left Park Lamps	This output control is used to activate the left park lamps when selecting On. The left park lamps should illuminate until commanded Off.
Right Park Lamps	This output control is used to activate the right park lamps when selecting On. The right park lamps should illuminate until commanded Off.
Left Daytime Running Lamps	This output control is used to activate the left daytime running lamps when selecting On. The left daytime running lamps should illuminate until commanded Off.
Right Daytime Running Lamps	This output control is used to activate the right daytime running lamps when selecting On. The right daytime running lamps should illuminate until commanded Off.
Left Auxiliary Daytime Running Lamps	This output control is used to activate the left auxiliary daytime running lamps when selecting On. The left auxiliary daytime running lamps should illuminate until commanded Off.
Right Auxiliary Daytime Running Lamps	This output control is used to activate the right auxiliary daytime running lamps when selecting On. The right auxiliary daytime running lamps should illuminate until commanded Off.
Left Front Auxiliary Park Lamp Command	This output control is used to activate the left front auxiliary park lamp when selecting On. The left front auxiliary park lamp should illuminate until commanded Off.
Right Front Auxiliary Park Lamp Command	This output control is used to activate the right front auxiliary park lamp when selecting On. The right front auxiliary park lamp should illuminate until commanded Off.
Left Front Turn Signal Lamp Command	This output control is used to activate the left front turn signal lamp when selecting On. The left front turn signal lamp should illuminate until commanded Off.
Right Front Turn Signal Lamp Command	This output control is used to activate the right front turn signal lamp when selecting On. The right front turn signal lamp should illuminate until commanded Off.
Left Turn Signal Repeater Lamp Command	This output control is used to activate the left turn signal repeater lamp when selecting On. The left turn signal repeater lamp should illuminate until commanded Off.
Right Turn Signal Repeater Lamp Command	This output control is used to activate the right turn signal repeater lamp when selecting On. The right turn signal repeater lamp should illuminate until commanded Off.
Rear Fog Lamp(s)	This output control is used to activate the rear fog lamp(s) when selecting On. The rear fog lamp(s) should illuminate until commanded Off.

Body Control Module — HVAC Controls — Scan Tool Output Controls

Output Control	Description
Blower Motor	This output control commands the HVAC blower motor speed, displayed in percent. The blower should be turning. The blower motor is a motor with a cage attached to force the air through ducts such as heater, ventilation and defrost ducts.

Body Control Module — Interior Lighting — Scan Tool Output Controls

Output Control	Description
Child Security Lock Indicator	This output control is used to activate the child security lock indicator when selecting On. The child security lock indicator should illuminate until commanded Off.
Dome/Reading Lamps Front Overhead Console	This output control is used to activate the dome/reading lamps when selecting On. The dome/reading lamps should illuminate until commanded Off.
Lane Departure Warning Indicator	This output control is used to activate the lane departure warning indicator when selecting On. The lane departure warning indicator should illuminate until commanded Off.
Security Indicator	This output control is used to activate the security indicator when selecting On. The security indicator should illuminate until commanded Off.

Body Control Module — Power Mode — Scan Tool Output Controls

Output Control	Description
Run/Crank Relay Command	This output control is used to command run/crank relay active or inactive.
Accessory/Retained Accessory Power Relay Command	This output control is used to command accessory/retained accessory power relay active or inactive.
Run Relay Command	This output control is used to command run relay active or inactive.
Power Mode Timeout	This output control is used to disable or enable the power mode timeout function (not whether timer is active or inactive).
Battery Saver Mode	This output control is used to enable or disable the transport mode state.

Body Control Module — Seat Heating/Venting/Cooling — Scan Tool Output Controls

Output Control	Description
Left Front Seat Heating	This output control is used to turn on/off all outputs for heating elements for the left front seat.
Right Front Seat Heating	This output control is used to turn on/off all outputs for heating elements for the right front seat.
Driver Seat Blower	This output control can be used for setting various blower speeds, but service tool will only turn on high to verify module outputs and fan operation.
Passenger Seat Blower	This output control can be used for setting various blower speeds, but service tool will only turn on high to verify module outputs and fan operation.

Body Control Module — Configuration/Reset Functions — Scan Tool Output Controls

Output Control	Description
Brake Pedal Position Sensor Learn	
Brake Pedal Position Sensor Learn	This output control is used to activate the brake pedal position sensor learn when selecting Learn. The brake pedal position sensor learn procedure should start.
HVAC Actuators Learn	
HVAC Actuators Learn	This output control is used to activate the HVAC actuators learn when selecting Learn. The HVAC actuators learn procedure should start.

K17 Electronic Brake Control Module: Scan Tool Information

The Electronic Brake Control Module (EBCM) scan tool data parameters list contains all ABS related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists.

Electronic Brake Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
ABS Pump Motor Voltage	—	0 V	The scan tool displays the commanded pump motor voltage.
Acceleration Sensor Longitudinal Signal	—	Varies	The scan tool displays 0–5 V depending on the vehicle's longitudinal acceleration.
Antilock Braking System	—	OK	The scan tool displays OK or Malfunction. Malfunction is displayed if there is an ABS malfunction.
Brake Booster Vacuum Sensor	—	Varies	The scan tool displays kPa (psi) This is the current vacuum.
Brake Booster Vacuum Sensor Supply	—	0 V	The scan tool displays 0–5 V depending on the brake booster vacuum sensor supply voltage.
Brake Fluid Level Sensor	—	OK	The scan tool displays OK when the brake fluid is at correct level and Low when the brake fluid is low.
Brake Pedal Position Sensor	Brake pedal released	Inactive	The scan tool displays Inactive or Active depending on the state of the brake pedal.
	Brake pedal applied	Active	
Brake Pressure Sensor	Brake pedal released	0–1 V	The scan tool displays 0–5 V depending on the applied hydraulic brake pressure.
	Brake pedal applied	1–5 V	
Brake Pressure Sensor	Brake pedal released	2000–3000 kPa	The scan tool displays the actual pressure applied to the brake pedal.
Delivered Torque	—	Varies	The scan tool displays 0–100% depending on the how much torque the engine is delivering.
Dynamic Rear Proportioning Status	—	OK	The scan tool displays OK or Malfunction. Malfunction is displayed if the EBCM disables the dynamic rear proportioning due to a fault.
Lateral Acceleration Signal	—	Varies	The scan tool displays 0–5 V depending on the vehicle's lateral acceleration.
Left Front Inlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the left front inlet solenoid valve is commanded ON.
Left Front Outlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the left front outlet solenoid valve is commanded ON.
Left Front Wheel Speed Sensor	—	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the left front wheel speed sensor.
Left Rear Inlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the left rear inlet solenoid valve is commanded ON.
Left Rear Outlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the left rear outlet solenoid valve is commanded ON.
Left Rear Wheel Speed Sensor	—	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the left rear wheel speed sensor.

Parameter	System State	Expected Value	Description
Panic Brake Assist Status	—	OK	The scan tool displays OK or Malfunction. Malfunction is displayed if the EBCM disables the panic brake assist due to a fault.
Pump Motor Relay Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the pump motor is commanded ON.
Primary Isolation Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the isolation solenoid valve is commanded ON.
Primary Prime Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the prime solenoid valve is commanded ON.
Requested Torque	—	Varies	The scan tool displays 0–100% depending on the how much torque is requested.
Right Front Inlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the right front inlet solenoid valve is commanded ON.
Right Front Outlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the right front outlet solenoid valve is commanded ON.
Right Front Wheel Speed Sensor	—	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the right front wheel speed sensor.
Right Rear Inlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the right rear inlet solenoid valve is commanded ON.
Right Rear Outlet Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the right rear outlet solenoid valve is commanded ON.
Right Rear Wheel Speed Sensor	—	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the right rear wheel speed sensor.
Secondary Isolation Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the isolation solenoid valve is commanded ON.
Secondary Prime Solenoid Valve Feedback	—	Inactive	The scan tool displays Inactive or Active. Active is displayed when the prime solenoid valve is commanded ON.
Steering Column Position	Steering wheel in straight position	−5 to +5°	The scan tool displays °. This is the current position of the steering angle sensor.
	Steering wheel turned left until stop	450–550°	
	Steering wheel turned right until stop	−550 to −450°	
System Voltage	—	11–14 V	The scan tool displays V. This is the current battery voltage.
Traction Control Switch	Traction control switch released	Inactive	The scan tool displays Inactive or Active depending on the traction control switch status.
	Traction control switch pressed	Active	
Traction Control System	—	OK	The scan tool displays OK or Malfunction. Malfunction is displayed if there is a traction control malfunction.
Vehicle Stability System	—	OK	The scan tool displays OK or Malfunction. Malfunction is displayed if there is a stability control malfunction.
Vehicle Stability Enhancement System Relay Feedback	—	Active	The scan tool displays Inactive or Active. Inactive is displayed when stability control is disabled.

Parameter	System State	Expected Value	Description
Vehicle Stability Enhancement System Switch	Traction control switch released	Inactive	The scan tool displays Inactive or Active depending on the traction control switch status.
	Traction control switch pressed	Active	
Yaw Rate Signal	—	Varies	The scan tool displays 0–5 V depending on the vehicle's yaw rate.

Electronic Brake Control Module Scan Tool Output Controls

Output Control	Description
ABS Left Front Solenoid Valves	Commands the solenoid valves ON or OFF.
ABS Left Rear Solenoid Valves	Commands the solenoid valves ON or OFF.
ABS Pump Motor	Commands the ABS pump motor Increase or Decrease.
ABS Right Front Solenoid Valves	Commands the solenoid valves ON or OFF.
ABS Right Rear Solenoid Valves	Commands the solenoid valves ON or OFF.
Automated Brake Bleed	This is used in order to bleed ABS hydraulics.
Brake Booster Electric Vacuum Pump	Commands the brake booster electric vacuum pump motor ON or OFF.
Traction Control Left Front Solenoid Valves	Commands the solenoid valves ON or OFF.
Traction Control Left Rear Solenoid Valves	Commands the solenoid valves ON or OFF.
Traction Control Right Front Solenoid Valves	Commands the solenoid valves ON or OFF.
Traction Control Right Rear Solenoid Valves	Commands the solenoid valves ON or OFF.

K20 Engine Control Module: Scan Tool Information (L5P)

Engine Control Module Scan Tool Data

Parameter	Value	Description
This is a comprehensive list. Not all parameters listed are available for all applications. **Base Operating Conditions:** Engine Idling/Radiator Hose Hot/Park or Neutral/Closed Loop/Accessories OFF		
4WD Low Signal	Enabled, Disabled, Invalid	This parameter contains several signals associated with the status of the four wheel drive system.
A/C Compressor Clutch Relay Command	On	This parameter displays the commanded state of the air conditioning (A/C) compressor output.
A/C Compressor Clutch Relay Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the air conditioning (A/C) clutch relay control circuit. It can display OK / Okay, Malfunction or Not Run. The parameter displays Malfunction if the A/C clutch relay control circuit is shorted to voltage.
A/C Compressor Clutch Relay Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the air conditioning (A/C) clutch relay control circuit. It can display OK / Okay, Malfunction or Not Run. The parameter displays Malfunction if the A/C clutch relay control circuit is shorted to ground.

Parameter	Value	Description
A/C Compressor Clutch Relay Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the air conditioning (A/C) clutch relay control circuit. It can display OK / Okay, Malfunction or Not Run. The parameter displays Malfunction if the A/C clutch relay control circuit is opened.
A/C Disable – A/C Pressure Out of Range	No	This parameter indicates if the A/C compressor was disengaged due to pressure out of range.
A/C Disengage History 1–8	Varies	This parameter indicates the last 8 A/C disengage history reasons. These events might include: • Refrigerant Pressure Too High • Engine Speed • Battery Voltage Out of Range • Engine Stall Prevention • Engine Speed Unstable • Wide Open Throttle • Vehicle Launch Acceleration • Engine Coolant Temperature Too High • Driver Motor Control Module Coolant • Temperature Too High • Transmission Fluid Temperature Too High • Maximum Accelerator Pedal Position • Air Bag Deployed • Hybrid Battery Pack State of Charge Too Low • Air Conditioning Relay Malfunction
A/C High Side Pressure Sensor	Volts	The scan tool displays 0–5 volts. The voltage applied to the ECM input for the A/C refrigerant pressure sensor.
A/C High Side Pressure Sensor	kPa (psi)	The scan tool displays 0–3450 kPa (0–500 psi). The voltage applied to the ECM input from the A/C refrigerant pressure sensor is converted to a pressure value.
A/C OFF for WOT	No	The scan tool displays Yes/No. The state of the A/C request related to wide open throttle.
	Yes	
A/C Request Signal	Yes	The scan tool displays Yes/No. The HVAC module receives an input request when the HVAC module is turned On.
	No	
Accelerator Pedal Position	%	This parameter displays the angle of the accelerator pedal as calculated by the control module using the signals from the accelerator pedal position sensors. The accelerator pedal position (APP) indicated angle is a range of values indicating a low percentage when the accelerator pedal is not depressed to a high percentage when the accelerator pedal is fully depressed.
Accelerator Pedal Position When Engine Overspeed Detected	%	This parameter displays the accelerator pedal position (APP) observed upon initial detection of an overspeed condition. This value will be updated upon each overspeed condition.

Parameter	Value	Description
Ambient Air Temperature	Varies	Outside temperature at any given altitude expressed in degrees
Ambient Humidity	Varies	Outside humidity at any given altitude expressed in a percentage.
APP Sensor 1	Volts	This parameter displays the voltage signal sent to the control module from APP sensor 1 of the APP sensor assembly. APP sensor 1 is a range of values indicating a low voltage when the accelerator pedal is not depressed to a high voltage when the accelerator pedal is fully depressed.
APP Sensor 1 and 2	Agree	This parameter displays Disagree if the control module detects the signal voltage from APP sensor 1 is not in correct relationship to APP sensor 2. The scan tool displays Agree under the normal operating conditions.
APP Sensor 1 Circuit Status	OK / Okay	APP Sensor 1 Out of Range indicates that the sensed accelerator pedal position 1 sensor value is currently out of range or that a Malfunction has been detected based upon the sensed accelerator pedal position 1 sensor value being out of range
APP Sensor 1 Learned Released Position	Volts	This Parameter indicates the accelerator pedal sensor 1 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the engine control module (ECM).
APP Sensor 1 Position	%	This parameter displays the angle of the APP sensor 1 as calculated by the control module using the signal from the APP sensor 1. APP sensor 1 is a range of values indicating a low percentage when the accelerator pedal is not depressed to a high percentage when the accelerator pedal is fully depressed.
APP Sensor 2	Volts	This parameter displays the voltage signal sent to the control module from APP sensor 2 of the APP sensor assembly. APP sensor 2 is a range of values indicating a low voltage when the accelerator pedal is not depressed to a high voltage when the accelerator pedal is fully depressed.
APP Sensor 2 Circuit Status	OK / Okay	APP Sensor 2 Out of Range indicates that the sensed accelerator pedal position 2 sensor value is currently out of range or that a malfunction has been detected based upon the sensed accelerator pedal position 2 sensor value being out of range
APP Sensor 2 Learned Released Position	Volts	This Parameter indicates the accelerator pedal sensor 2 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the engine control module (ECM).

Parameter	Value	Description
APP Sensor 2 Position	%	This parameter displays the angle of the APP sensor 2 as calculated by the control module using the signal from the APP sensor 2. APP sensor 2 is a range of values indicating a low percentage when the accelerator pedal is not depressed to a high percentage when the accelerator pedal is fully depressed.
APP Sensors	%	This Parameter contains the accelerator pedal position resulting directly from the settling of differences of the accelerator pedal position sensors (prior to any compensation to determine driver intent).
Average Reductant Consumption	g/km	This parameter displays the average reductant consumption in gallons per kilometer.
Average DPF Regeneration Duration	hh:mm:ss	This parameter contains the mean duration of the diesel particulate filter regenerations. The value in this parameter shall be updated after every diesel particulate filter regeneration attempt.
Average DPF Inlet Temperature During Regeneration	ºC (ºF)	This parameter contains the mean diesel particulate filter inlet temperature, during the diesel particulate filter regenerations.
BARO Sensor 1-2	Varies with altitude	This parameter displays the barometric pressure in kPa.
BARO Sensor 1-2	Varies with altitude	This parameter displays the barometric pressure in volts.
Base Injector Fuel Rate	Varies	This parameter displays the base calculated rate fuel delivered. The rate is calculated in cubic millimeters.
Battery Type	N/A	This parameter displays the battery type.
Battery Voltage	Volts	This parameter displays the battery voltage.
Battery Voltage High Resolution	Volts	This parameter displays the high resolution battery voltage value.
Boost System Monitor Complete	Yes	The scan tool displays Yes when the Boost System Monitor is Complete. If the scan tool displays No this could indicate a malfunction in the Boost System Monitor circuit.
Boost System Monitor Complete This Ignition Cycle	Yes/No	The scan tool displays Yes when the Boost System Monitor Complete This Ignition Cycle is completed.
Boost System Monitor Enabled	Yes	The scan tool displays Yes when the Boost System Monitor is Enabled. If the scan tool displays No this could indicate a malfunction in the Boost System Monitor circuit.
Boost System Monitor Enabled This Ignition Cycle	Yes/No	The scan tool displays Yes when the Boost System Monitor is Enabled during an ignition cycle.
Brake Pedal Position Circuit Signal	Applied/Released	This parameter displays the status of the brake pedal position circuit.
Brake Pedal Position Sensor	Volts	This parameter displays the brake pedal position sensor in volts.
Brake Pedal Position Sensor	%	This parameter displays the brake pedal position sensor in percentage applied.

Parameter	Value	Description
Brake Pedal Position Sensor Learned Released Position	Volts	This parameter displays the brake pedal learned released position in volts.
Brake Pedal Position Sensor Signal	Applied / Released	This parameter displays the status of the brake pedal as determined by the ECM.
Calculated Catalyst Temperature	°C (°F)	The parameter displays the calculated catalyst temperature in both Celsius and Fahrenheit.
Calculated NOx Catalyst Efficiency	%	This parameter contains the estimated average efficiency determined by the SCR (Selective Catalyst Reduction) efficiency monitor.
Calculated DPF Flow	kPa/(liter/s)	This parameter displays the filtered flow resistance of the DPF.
Calculated Particulate Filter Soot Accumulation	%	This parameter contains the most reliable estimation of the soot mass trapped in the diesel particulate filter.
Calculated Soot Mass Causing DPF Pressure Differential	g	This parameter displays the calculated soot mass causing a DPF pressure differential.
Calibration History Buffer	Locked/Unlocked	This parameter displays when the calibration buffer has been locked against further updates due to detection of a non-production calibration.
Calibration Verification Number History 1 – 10	#	This parameter displays the history of calibration verification from 1–10.
Camshaft Position Active Counter	Counts	This parameter displays an incrementing counter when the control module receives a signal from the camshaft position sensor.
Camshaft Position Sensor	RPM	This parameter displays the speed of the engine as calculated by the signal from a camshaft position (CMP) sensor. This parameter will always display 0 unless a condition with the CKP sensor or CKP reluctor exists. If a CKP condition exists the control module will use a valid CMP sensor signal to determine engine speed and crank/camshaft position.
Camshaft Position Signal Output Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to voltage.
Camshaft Position Signal Output Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to ground.
Camshaft Position Signal Output Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is open.
Catalyst Monitor Complete	Yes	This parameter indicates the status of the Catalyst. The scan tool displays Yes when the diagnostic is complete. And No if the diagnostic has Not ran or a malfunction is detected in the Catalyst.

Parameter	Value	Description
Catalyst Monitor Complete This Ignition Cycle	Yes/No	This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates Yes or No when the catalyst monitor diagnostic is actively running a test
Catalyst Monitor Enabled	Yes/No	The scan tool displays Yes when the Catalyst Monitor is Enabled. If the scan tool displays No this could indicate a malfunction in the Catalyst Monitor circuit.
Catalyst Monitor Enabled This Ignition Cycle	Yes/No	This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates Yes or No when the catalyst monitor diagnostic is actively running a test
Change Engine Oil Indicator Command	Off	Engine Oil Change Indication On indicates that the change engine oil indication is being requested On in order to inform the driver that the engine oil needs to be changed.
Charge Air Cooler Temperature	Varies	This parameter displays the charge air cooler temperature measured by a sensor located first in the charge air cooler stream.
Charge Air Cooler Inlet Temperature	ºC (ºF)	This parameter contains the undefaulted charge air cooler temperature measured by a sensor located first in the charge air cooler stream in relationship to any other charge air cooler temperature sensors in the system.
Charge Air Cooler Outlet Temperature	ºC (ºF)	This parameter contains the undefaulted charge air cooler temperature measured by a sensor located second in the charge air cooler stream in relationship to any other charge air cooler temperature sensors in the system.
{ If equipped } Clutch Pedal Starter Inhibit Switch	On	This parameter displays ON when the clutch pedal is released.
{ If equipped } Clutch Pedal Switch	Released	This parameter displays the state of the clutch pedal as determined by the control module from the clutch pedal switch.
Component Monitor Complete	Yes/No	This parameter displays Yes when the Component Monitor is Complete. The engine control module looks at many input and output components to make this determination. If a malfunction is detected the scan tool will display No.
Component Monitor Enabled	Yes/No	This parameter displays Yes when Component Monitor is Enabled. And No when it is not Enabled.
Compression Test	Not Running	This parameter displays the status of the engine compression test.
Control Module Voltage Signal	B+	This parameter displays the voltage of the power input to the engine control module. Since battery voltage is not directly measured by engine control module, switched battery voltage from the Run/Crank input to the engine control module is displayed.
Cooling Fan Command	%	This parameter displays the cooling fan duty cycle.

Parameter	Value	Description
Cooling Fan Control Circuit 1–2 High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the cooling fan control circuit. The parameter displays Malfunction if the cooling fan control circuit is shorted to voltage.
Cooling Fan Control Circuit 1–2 Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the cooling fan control circuit. The parameter displays Malfunction if the cooling fan control circuit is shorted to ground.
Cooling Fan Control Circuit 1–2 Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the cooling fan control circuit. The parameter displays Malfunction if the cooling fan control circuit is opened.
Cooling Fan Speed	Varies	This parameter displays the current state of the cooling fan speed. (For example OFF, Low, Medium, or High) rather than rotational speed.
Cooling Motor Fan Command	%	This parameter displays the cooling fan duty cycle.
Crank Request Signal	Yes	This parameter displays the state of the crank request input to the control module from the ignition switch. The scan tool will display Yes when the ignition switch is in the Crank position. The scan tool will display No when the ignition switch is in any other position.
Crankshaft Position Active Counter	Counts	This parameter displays an incrementing counter when the control module receives a signal from the crankshaft position sensor (CKP).
Crankshaft Position Sensor	RPM	This parameter displays engine speed.
Crankshaft Position Sensor	Volts	This parameter displays the displacement of the clutch pedal (corrected and normalized based upon its learned released and fully applied positions), where 0% corresponds to the clutch pedal being released and 100% corresponds to the clutch pedal being fully applied.
Crankshaft Position Sensor	%	This parameter displays the clutch pedal position sensor analog input as a percentage of its reference voltage.
Crankshaft Position Variation Learn	Not Learned	This parameter displays if the crank angle learned this key cycle.
Crankshaft Position Variation Learn Status Engine Speed Range 1	Not Learned	This parameter displays the progress for the crank wheel adaption learning at 900–1450 rpm.
Crankshaft Position Variation Learn Status	Complete	This parameter displays the status of the crank angle sensing error (CASE) learn algorithm.
Crankshaft Position Variation Learn Status Engine Speed Range 2	Not Learned	This parameter displays the progress for the crank wheel adaption learning at 1451–1900 rpm.
Cruise Control	Inactive	This parameter displays the status of the cruise control system as determined by the control module. The scan tool will display Active when the cruise control system is in control of vehicle speed. The scan tool will display Inactive when the cruise control system is not operating.

Parameter	Value	Description
Cruise Control	Disabled	This parameter displays the status of the cruise control system as determined by the control module. The scan tool will display Enabled when the cruise control system is in control of vehicle speed. The scan tool will display Disabled when the cruise control system is not operating.
Cruise Control Cancel Switch	Inactive	This parameter displays the status of the cruise control cancel switch
Cruise Control Inhibit Reason	None	The parameter displays the reason the cruise control system cannot engage.
Cruise Control On/Off Switch	Off	This parameter displays the state of the On/Off switch input to the control module . The scan tool will display On when the cruise On/Off switch is ON. The scan tool will display Off when the cruise ON/OFF switch is OFF.
Cruise Control Resume/Acceleration Switch	Inactive	This parameter displays the state of the Resume/Accel switch input to the control module When the cruise control switch is in the On position and the Resume/ Accel switch is activated, the scan tool displays On. When the Resume/Accel switch is released the scan tool displays Off.
Cruise Control Set/Coast Switch	Inactive	This parameter displays the state of the Set/Coast switch input to the control module from the cruise control system. When the cruise control switch is in the on position and the Set/Coast switch is activated, the scan tool displays Active. When the Set/Coast switch is released the scan tool displays Inactive.
Cruise Control Disengage 1–8 History	Reason for Cruise Disengagement	These parameters indicate the last 8 reasons the ECM disengaged the cruise control. Reason 1 contains the most recent reason. The reasons may include the following: Brake Pedal Initialize, Cancel, Clutch, Coast Disengage, Coast Speed Low, TAC Inhibit, Accel Rate, Decel Rate, High Speed, Illegal Mode, Low Speed, None, Cruise Sw OFF, Over Set Speed, S/C On Speed Hi, ECM Inhibit, Simul S/C-R/A, TCS, Under Set Speed, DLC Override, Memory DTC, Eng Run Time, Engine Speed, DTC Set, RPM Limit, First Gear, APP Override, Low Voltage, D Whl Spd Low, D Whl Spd Hi, Cruise S/S, Cruise Sw Data, ECT Overtemp, VSES, Trans. DTC, BPP Data, BPP DTC, Park Brake, ACC Inhibit, ACC Brake DTC, ACC Option, ACC Brake Inop, PTO Active.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Balancing Rate	Varies	These parameters display the adjustment in fuel volume for each cylinder as calculated by the control module. The scan tool will display a negative balancing rate if the fuel volume is lowered. The scan tool will display a positive balancing rate if the fuel volume is increased.

Parameter	Value	Description
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Compression Test Time After TDC	Varies	This parameter displays the captured time it takes for the crankshaft to travel from Top Dead Center (TDC) to a calculated distance in degrees. The ECM stores the value from the latest performed engine compression test. A longer travel time indicates a bad cylinder.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Compression Test Time Before TDC	Varies	This parameter displays the captured time it takes for the crankshaft to travel a calculated distance in degrees before it reaches Top Dead Center (TDC). The ECM stores the value from the latest performed engine compression test. A shorter travel time indicates a bad cylinder.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Current Misfire Counter	Counts	This parameter displays the number of misfires detected for cylinder's 1–8 within the current 100 engine cycle test interval. The set of misfire counters for the individual cylinders are maintained such that if a single misfire is detected over an engine cycle.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 History Misfire Counter	Count	This parameter displays the number of misfires detected for cylinder's 1–8 since a misfire failure has been reported.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injection Timing	°	This parameter displays the start point of the main injection in degrees crank shaft (°CS) relative to Top Dead Center (TDC) of cylinder's 1–8.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Command	ms	This parameter displays the total injection time of cylinder's 1–8. Total injection time includes all pilot injections, main injections and post injections.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Status	OK / Okay	This parameter displays the status of the fuel injector's 1–8 output malfunction for Short circuit from injector high side to ground or system voltage, Short circuit from injector low side to injector low side, Short circuit from injector low side to ground or system voltage, Short circuit from injector high side to low side and Injector open circuit.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit High Voltage Test Status	OK / Okay	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to voltage.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Low Voltage Test Status	OK / Okay	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to ground.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Open Test Status	OK / Okay	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is open.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Flow Identifier	Varies	This parameter is used to correct the injected quantity of each injector When injectors are replaced or exchanged, the Injector Quantity adjustment values of the replaced or exchanged injectors have to be entered into the ECM to ensure acceptable engine performance regarding emissions
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Pilot Injection Command	On/Off	This parameter displays the pilot injection status information for the injectors.

Parameter	Value	Description
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Post Injection Command	ms	This parameter displays the 2nd fuel injection time for Cylinder's 1–8.
Cylinder Head Temperature Sensor	°C (°F)	This parameter displays the cylinder head temperature in °C (°F).
Deceleration Fuel Cut-Off	Inactive	Decel Fuel Cut Off Active indicates that the conditions to enable deceleration fuel cut-off (DFCO) are active and that torque is being reduced by turning off one or more fuel injectors
Desired Boost Pressure	Varies	This parameter displays the Turbocharger Boost pressure as commanded by the control module. This parameter shows the turbocharger boost pressure in kPa.
Desired Cooling Fan Speed	RPM	This parameter displays the desired fan speed for engine driven fan systems.
Desired EGR Position	%	This parameter displays the position of the exhaust gas recirculation (EGR) valve commanded by the control module. The scan tool will display 0 percent when the control module is commanding the EGR valve closed. The scan tool will display a higher percentage when the EGR valve is commanded open.
Desired EGR Cooler Bypass Valve Position	%	This parameter contains the desired exhaust gas recirculation (EGR) cooler bypass valve displacement (corrected based upon its learned minimum position).
Desired Fuel Pressure Regulator 1 Current	mA	This parameter displays the desired current for the fuel pressure control metering unit
Desired Fuel Pressure	kPa (psi)	This parameter displays the desired fuel supply pressure.
Desired Fuel Rail Pressure	MPa (psi)	This parameter displays the desired fuel rail pressure as calculated by the control module. This value is calculated based on engine speed, engine load, and sensor inputs. The scan tool will display a higher value at higher engine speeds and loads, and a lower value at idle.
Desired Idle Speed	RPM	This parameter displays the engine idle speed in RPM as commanded by the control module. The control module compensates for various engine loads in order to maintain the desired engine speed at idle. This parameter is not valid unless the engine is running.
Desired Intake Air Flow Valve Position	%	This parameter will display the position of the intake air flow valve as a percentage.
Desired NOx Catalyst Reductant Load	—	This parameter contains the NH3 (Ammonia) storage setpoint value for the SCR (Selective Catalyst Reduction) system in terms of gram.
Desired Reductant Injector Command	ms	This parameter contains the desired injection time of the reductant dosing valve.
Desired Reductant Pressure	kPa (psi)	This parameter contains the desired reductant system pressure.
Desired Reductant Pump Speed	RPM	This parameter contains the desired reductant pump motor speed.

Parameter	Value	Description
Desired Turbocharger Vane Position	Varies	This parameter displays the position of the turbocharger vane position sensor as the turbocharger vane position is commanded by the control module. The scan tool will display 0 percent when the control module is commanding the vanes open. The scan tool will display a higher percentage when the vanes are commanded closed.
Diesel Particulate Filter Pressure	kPa (psi)	This parameter contains the diesel particulate filter pressure calculated as the difference between ambient air pressure (barometric pressure) and the exhaust gas pressure
Distance Since DTC Cleared	km/miles	This parameter displays the distance accumulated since an emission diagnostic trouble code was cleared. The scan tool will display increasing distance as the vehicle is driven.
Distance Since First Malfunction	km/miles	This parameter displays the distance accumulated since first malfunction was captured. This parameter is only meaningful within the context of a failure record or freeze frame.
Distance Since Last DPF Regeneration	Varies	This parameter will display the amount of vehicle travel after a DPF regeneration. This parameter will be displayed in km/ miles.
Distance Since Last Malfunction	km/miles	This parameter displays the distance accumulated since last malfunction was captured. This parameter is only meaningful within the context of a failure record or freeze frame.
Distance This Driving Cycle	km/miles	This parameter displays the distance a vehicle has traveled in the current driving cycle.
Distance Traveled	km/miles	This parameter displays the distance driven since the last electrically erasable programmable read only memory (EEPROM) initialization.
DPF Differential Pressure	kPa	This parameter displays the pressure difference between the first and second DPF pressure sensors.
DPF Differential Pressure (Corrected)	kPa	This parameter displays the adapted value of the DPF differential pressure sensor.
DPF Differential Pressure Sensor	Volts	This parameter will display the voltage differential between the front and rear pressures at the DPF as calculated by the ECM. This will be displayed in volts. As the DPF becomes restricted the differential pressure increases and the voltage will get higher.
DPF Indicator Command	Off	This parameter will display the status of the IPC mounted DPF status light. This parameter will display On/Off.
DPF Monitor Complete	Yes	This parameter displays the status of the DPF monitor, the parameter displays Yes when the monitor is complete.
DPF Monitor Complete This Ignition Cycle	Yes	This parameter displays Yes if completion status during the current driving / monitoring cycle of the DPF Monitor is complete.

Parameter	Value	Description
DPF Monitor Enabled	Yes	This parameter displays Yes if the enabling conditions are complete.
DPF Monitor Enabled This Ignition Cycle	Yes	This parameter displays Yes if the enabled status during the current driving / monitoring cycle of the DPF Monitor is complete.
DPF Pressure Differential Due to Soot	kPa	This parameter will display the difference between the front and rear pressures at the DPF as calculated by the ECM due to soot.
DPF Regeneration Inhibit Reason	None	This parameter displays the regeneration interruption reason for normal regeneration.
DPF Regeneration Reason	None	This parameter displays the regeneration demand and completion status.
DPF Regeneration Status	Inactive/Active	This parameter displays the status of the Diesel Particulate regeneration activity.
DPF Regenerations Completed	Counts	This parameter displays the number of successful regenerations.
DPF Soot Accumulation	g	This parameter displays the mass of soot in the Diesel Particle Filter measured in grams
DPF Soot Mass Correction	g	This parameter contains the total correction to the soot mass caused by CRT (Continuous Regeneration Trap) effect.
Drag control Status	Active/Inactive	EDC Active (Drag Active) control mode is indicated when the requested torque signal is above the driver requested value while the traction control system signal input is active.
Driver Demanded Engine Torque	%	This parameter displays the requested torque output of the engine by the driver.
Drop Throttle Detected while Traction Control Active	No	Drop Throttle Control Mode is indicated when this parameter displays Yes.
Drop Throttle Status	Inactive	This parameter provides an indication when the controller software determines a condition is present where the vehicle operator has abruptly released the accelerator pedal (drop-throttle) after a period of acceleration.
ECM Authentication Status	Valid	Authentication Status indicates the result of the comparison between the last received immobilizer response and the expected response calculated by the engine control module (ECM).
ECM Challenge Status	Valid	This parameter displays the condition of the ECM code challenge to the BCM.
ECM Requested Particulate Matter Mass Concentration Measurement	No	This parameter indicates the ECM has requested a measurement of particulate matter mass from the particulate matter sensor.
ECM Requested Particulate Matter Sensor Initialization	No	This parameter displays Yes when the particulate matter sensor is initialized by the ECM.
ECM Response Source	Normal Start	This parameter displays ECM response source.

Parameter	Value	Description
ECT Sensor	°C/°F	This parameter displays the temperature of the engine coolant based on the input from the engine coolant temperature (ECT) sensor. When the coolant temperature is low, the scan tool will display a low temperature. When the coolant temperature is high, the scan tool will display a high temperature.
EGR/Camshaft Position Monitor Complete	Yes/No	This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/ Camshaft Position Monitor is complete.
EGR/Camshaft Position Monitor Complete This Ignition Cycle	Yes/No	This parameter displays the status of the EGR/Camshaft Position Monitor for this Ignition Cycle. The parameter will display Yes when the EGR/Camshaft Position Monitor is complete this Ignition Cycle.
EGR/Camshaft Position Monitor Enabled	Yes/No	This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/ Camshaft Position Monitor is Enabled.
EGR/Camshaft Position Monitor Enabled This Ignition Cycle	Yes/No	This parameter displays the status of the EGR/Camshaft Position Monitor for this Ignition Cycle. The parameter will display Yes when the EGR/Camshaft Position Monitor is Enabled this Ignition Cycle.
EGR Command	%	This parameter displays the commanded duty cycle for the exhaust gas recirculation (EGR) output.
EGR Control Circuit 1 High Voltage Status	OK / Okay, Malfunction	This parameter displays the state of the EGR Control circuit 1. The parameter displays Malfunction if the EGR Control circuit 1 is shorted to voltage.
EGR Control Circuit 1 Low Voltage Status	OK / Okay, Malfunction	This parameter displays the state of the EGR Control circuit 1. The parameter displays Malfunction if the EGR Control circuit 1 is shorted to ground.
EGR Control Circuit 2 High Voltage Status	OK / Okay, Malfunction	This parameter displays the state of the EGR Control circuit 2. The parameter displays Malfunction if the EGR Control circuit 2 is shorted to voltage.
EGR Control Circuit 2 Low Voltage Status	OK / Okay, Malfunction	This parameter displays the state of the EGR Control circuit 2. The parameter displays Malfunction if the EGR Control circuit 2 is shorted to ground.
EGR Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the EGR Control circuit. The parameter displays Malfunction if the EGR Control circuit is open.
EGR Control Circuit Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the EGR Control circuit. The parameter displays Malfunction if the EGR Control circuit is shorted.
EGR Control Driver Overcurrent	No	This parameter displays the state of the EGR Control circuit. The parameter displays Yes if the EGR Control Driver Overcurrent is detected.
EGR Control Driver Overtemperature	No	This parameter displays the state of the EGR Control circuit. The parameter displays Yes if Over Temperature is Detected and that the driver circuit has been shut OFF.

Parameter	Value	Description
EGR Control Driver Temperature Dependent Overcurrent	No	This parameter displays the state of the EGR Control circuit. The parameter displays Yes if Temperature Dependent over Current Detected and that the driver circuit has been shut OFF.
EGR Control Driver Undervoltage	No	This parameter displays the state of the EGR Control circuit. The parameter displays Yes when the Under Voltage Detected indicates that the entire system voltage is low.
EGR Cooler Bypass Valve Command	%	This parameter displays the commanded duty cycle for the Exhaust Gas Recirculation Cooler Bypass Valve actuator output.
EGR Cooler Bypass Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the EGR Cooler Bypass Valve Control circuit. The parameter displays Malfunction if the EGR Cooler Bypass Valve Control circuit is shorted to voltage.
EGR Cooler Bypass Valve Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the EGR Cooler Bypass Valve Control circuit. The parameter displays Malfunction if the EGR Cooler Bypass Valve Control circuit is shorted to ground.
EGR Cooler Bypass Valve Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the EGR Cooler Bypass Valve Control circuit. The parameter displays Malfunction if the EGR Cooler Bypass Valve Control circuit is open.
EGR Cooler Bypass Valve Control Circuit Shorted Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the control circuit status of the exhaust gas recirculation cooler bypass valve output
EGR Cooler Bypass Valve Control Driver Overcurrent	No	This parameter displays the state of the EGR Cooler Bypass Valve Control circuit. The parameter displays Yes if the EGR Cooler Bypass Valve Control Driver Overcurrent is detected.
EGR Cooler Bypass Valve Control Driver Overtemperature	No	This parameter displays the state of the EGR Cooler Bypass Valve Control circuit. The parameter displays Yes if Over Temperature is Detected and that the driver circuit has been shut OFF.
EGR Cooler Bypass Valve Control Driver Temperature Dependant Overcurrent	No	This parameter displays the state of the EGR Cooler Bypass Valve Control circuit. The parameter displays Yes if Temperature Dependent over Current Detected and that the driver circuit has been shut OFF.
EGR Cooler Bypass Valve Control Driver Undervoltage	No	This parameter displays the state of the EGR Cooler Bypass Valve Control circuit. The parameter displays Yes when the Under Voltage Detected indicates that the entire system voltage is low.
EGR Cooler Bypass Valve Learned Closed Position	OK / Okay, Malfunction, Not Run	This parameter contains the control circuit status of the exhaust gas recirculation cooler bypass valve output
EGR Cooler Bypass Valve Learned Open Position	OK / Okay, Malfunction, Not Run	This parameter contains the control circuit status of the exhaust gas recirculation cooler bypass valve output

Parameter	Value	Description
EGR Cooler Bypass Valve Position	%	This parameter contains the actual exhaust gas recirculation (EGR) cooler bypass valve displacement determined by a position sensor (corrected based upon its learned minimum position).
EGR Cooler Bypass Valve Position Sensor	Volts	This parameter contains the Exhaust Gas Recirculation Cooler Bypass Valve position sensor analog input as a percentage of its reference voltage
EGR Cooler Temperature Sensor 1	°C (°F)	This parameter will display the exhaust temperature entering the EGR Cooler. The EGR Temp Sensor 1 temperature will be warmer than the EGR Temp Sensor 2.
EGR Cooler Temperature Sensor 2	°C (°F)	This parameter will display the exhaust temperature exiting the EGR Cooler. The EGR Temp Sensor 2 temperature will be cooler than the EGR Temp Sensor 1.
EGR Temperature Sensor 1	ºC (ºF)	This parameter contains the undefaulted exhaust gas recirculation cooler temperature measured by a sensor that is located before the inlet of the EGR heat exchanger.
EGR Temperature Sensor 2	ºC (ºF)	This parameter contains the undefaulted exhaust gas recirculation cooler temperature measured by a sensor that is located on the outlet of the EGR heat exchanger.
EGR Learned Minimum Position	Volts	This parameter displays the learned minimum position of the EGR valve as calculated by the control module. The scan tool will display a low value if the current closed EGR position is the same as the last ignition cycle. The scan tool will display a higher value if the EGR valve has closed at a new position.
EGR Learned Minimum Position This Ignition Cycle	%	This parameter displays the Exhaust Gas Recirculation Sensor Learned Minimum Position.
EGR Position Sensor	%	This parameter displays the EGR valve position as calculated by the control module based on an input from the EGR valve position sensor. The scan tool will display a lower value when the EGR valve is closed, and a higher value when the EGR valve is open.
EGR Position Sensor	Volts	This parameter displays the voltage signal received from the EGR valve position sensor by the control module. The scan tool will display a lower value when the EGR valve is closed, and a higher value when the EGR valve is open.
EGR Position Variance	%	This parameter displays the EGR position variance from the last learned position.
EGR System Malfunction Warning Indicator Command	Off	This parameter indicates when the EGR system malfunction warming indicator is commanded ON.
Electric Power management Inhibit reason	None	This parameter displays the reason of the Regulated Voltage Control (RVC) override command. RVC lowers system operating voltage to reduce system electrical load and improve fuel economy performance.

Parameter	Value	Description
Engine Calibration Monitoring	Not Present	This parameter displays Present when Incorrect Engine Calibration Detected.
Engine Calibration Monitoring Identifier	Programmed / Not Programmed	This parameter contains status bits associated with the Engine Upgrade Protection strategy.
Engine Calibration Part Number History 1–10	#	This parameter displays the part number of the 10 most recent calibrations.
Engine Calibration Part Number History 1–10 Counter	Counts	This parameter displays the current count of engine calibrations.
Engine Controls Ignition Relay Command	On	This parameter displays the state of the control circuit for engine control module power relay as commanded by the engine control module.
Engine Controls Ignition Relay Feedback 2 Signal	Volts	This parameter indicates the signal voltage from the second input to the controller from the powertrain relay.
Engine Controls Ignition Relay Feedback 3 Signal	Volts	This parameter indicates the signal voltage from the third input to the controller from the powertrain relay.
Engine Controls Ignition Relay Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to voltage.
Engine Controls Ignition Relay Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to ground.
Engine Controls Ignition Relay Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is open.
Engine Controls Ignition Relay Feedback Signal	Volts	This parameter displays the voltage available at the Engine Controls Ignition Relay pin of the engine control module.
Engine Load	Varies	This parameter displays the engine load in percent based on inputs to the control module from various engine sensors. The scan tool will display a low percentage when the engine is at idle with little or no load. The scan tool will display a high percentage when the engine is running at a high RPM under a heavy load.
Engine Load During Misfire History 1-10	%	This parameter displays the engine load during the last misfire event.
Engine Off Time	Seconds – Varies	This parameter displays the amount of time that has elapsed since the engine was last cycled OFF.
Engine Oil Absolute Pressure Sensor	kPa (psi)	This parameter displays the absolute pressure of the engine oil in kPa and psi.

Parameter	Value	Description
Engine Oil Level Switch	OK / Okay, Low	This parameter displays the status of the engine oil level switch as determined by the control module. The control module uses this information to turn on the low engine oil lamp if the engine oil level remains approximately 1 quart low for a sufficient amount of time. The scan tool will display Low when the engine oil level is low. The scan tool will display OK / Okay when the engine oil level is correct.
Engine Oil Life Remaining	Varies	This parameter displays the amount engine oil life remaining before requiring an oil change based on calculations by the control module. The scan tool will display lower values as the engine oil life approaches 0 miles.
Engine Oil Pressure	kPa (psi)	This parameter displays the pressure of the engine oil as calculated by the control module using a signal from the engine oil pressure (EOP) sensor. The scan tool will display oil pressure when the engine is running. The engine oil pressure sensor has a range of values indicating a low value when the oil pressure is low to a high value when the oil pressure is high.
Engine Oil Pressure Control Solenoid Valve Command	High Pressure/Low Pressure	This parameter displays the current command of the oil pressure solenoid valve.
Engine Oil Pressure Control Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the engine oil pressure control solenoid circuit. The parameter displays Malfunction if the engine oil pressure control solenoid circuit is shorted to voltage.
Engine Oil Pressure Control Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the engine oil pressure control solenoid circuit. The parameter displays Malfunction if the engine oil pressure control solenoid circuit is shorted to ground.
Engine Oil Pressure Control Solenoid Valve Control Circuit Open Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the engine oil pressure control solenoid circuit. The parameter displays Malfunction if the engine oil pressure control solenoid circuit is open.
Engine Oil Pressure Sensor	Volts	This parameter displays the actual engine oil pressure measured by a sensor in volts.
Engine Oil Pressure Switch	OK / Okay , Low	This parameter displays the state of the EOP as determined by the control module. The control module monitors the engine oil pressure (EOP) switch to determine if the EOP is sufficient. The scan tool will display low when the EOP is below a predetermined value.
Engine Run Time	Varies	This parameter displays the time elapsed since the engine was started. The scan tool will display the time in hours, minutes and seconds. The engine run time will reset to zero when the engine stops running.
Engine Run Time Since Last DPF Regeneration	Varies	This parameter displays the total of time since the last regeneration. This parameter will be displayed in hours, minutes and seconds.

Parameter	Value	Description
Engine Serial Number	#	This parameter displays the current engine serial number.
Engine Speed	RPM	This parameter displays the speed of the crankshaft as determined by the ECM using an input from the CKP sensor. The scan tool will display a high value at high engine speeds and a low value at low engine speeds.
Engine Speed During Misfire History 1–5	RPM	This parameter displays the last 5 engine speeds during misfire events.
Engine Speed When Engine Overspeed Detected	RPM	This parameter displays the engine speed observed upon initial detection of an overspeed condition. This value will be updated after each overspeed condition.
Engine Torque	Varies	This parameter displays the estimated amount of torque that is delivered from the engine. The scan tool displays engine torque in newtonm (lb-ft). The ECM sends the engine torque information to the TCM via the high speed GMLAN serial data line.
{ If equipped } Exhaust Aftertreatment Fuel Injection System	Inactive	This parameter displays the state of the Exhaust Aftertreatment Fuel Injection System command.
{ If equipped } Exhaust Aftertreatment Fuel Injector Test Abort Reasons	None, Fuel Pressure Out of Range, Vehicle Speed Detected, Incorrect Power Mode, Exhaust Gas Temperature Too High, DTC Present, Diesel Particulate Filter Regeneration Active, Engine Must Be Running, Transmission Must Be in Park or Neutral, Exhaust Gas Temperature Too Low	This parameter contains the abort reason for the Exhaust Aftertreatment Fuel Injector Tip Cleaning Trigger Device Control and Exhaust Aftertreatment Fuel Injector Flow Test Trigger
{ If equipped } Exhaust Aftertreatment Fuel Injector Test Status	Not Requested, Flow Test Active, Flow Test Complete, Flow Test Aborted, Cleaning Procedure Active, Cleaning Procedure Complete, Cleaning Procedure Aborted	This parameter contains the status of the Exhaust Aftertreatment Fuel Injector Tip Cleaning and Flow Test device controls.
{ If equipped } Exhaust Aftertreatment Fuel Injector Command	%	This parameter displays the state of the Exhaust Aftertreatment Fuel Injection System command in percentage.
{ If equipped } Exhaust Aftertreatment Fuel Injector Control Circuit Command	Off	This parameter displays the state of the Exhaust Aftertreatment Fuel Injection Control Circuit command.
{ If equipped } Exhaust Aftertreatment Fuel Injector Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the exhaust aftertreatment fuel injector control circuit. The parameter displays Malfunction if the exhaust aftertreatment fuel injector circuit is shorted to voltage.
{ If equipped } Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the exhaust aftertreatment fuel injector control circuit. The parameter displays Malfunction if the exhaust aftertreatment fuel injector control circuit is shorted to ground.
{ If equipped } Exhaust Aftertreatment Fuel Injector Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the status of the exhaust aftertreatment fuel injector control circuit. The parameter displays Malfunction if the exhaust aftertreatment fuel injector control circuit is open.

Parameter	Value	Description
{ If equipped } Exhaust Aftertreatment Fuel Injector Control Circuit Shorted Test Status	OK / Okay , Malfunction	This parameter displays the status of the exhaust aftertreatment fuel injector control circuit. The parameter displays Malfunction if the exhaust aftertreatment fuel injector control circuit is shorted.
{ If equipped } Exhaust Aftertreatment Fuel Injector Control Driver Overtemperature	No	This parameter displays if the Exhaust Aftertreatment Fuel Injector Control Driver (low side) has reached an overtemperature condition.
{ If equipped } Exhaust Aftertreatment Fuel Injector High Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the exhaust aftertreatment fuel injector high control circuit. The parameter displays Malfunction if the exhaust aftertreatment fuel injector high control circuit is shorted to voltage.
{ If equipped } Exhaust Aftertreatment Fuel Injector High Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the exhaust aftertreatment fuel injector high control circuit. The parameter displays Malfunction if the exhaust aftertreatment fuel injector high control circuit is shorted to ground.
{ If equipped } Exhaust Aftertreatment Fuel Injector High Control Driver Overtemperature	No	This parameter displays if the Exhaust Aftertreatment Fuel Injector High Control Driver (high side) has reached an overtemperature condition.
{ If equipped } Exhaust Aftertreatment Monitor Complete	No	This parameter displays the state of Exhaust Aftertreatment Monitor. The parameter displays Yes when the Exhaust Aftertreatment Monitor is complete.
{ If equipped } Exhaust Aftertreatment Monitor Complete This Ignition Cycle	No	This parameter displays the state of Exhaust Aftertreatment Monitor Complete This Ignition Cycle. The parameter displays Yes when the Exhaust Aftertreatment Monitor is Complete This Ignition Cycle.
{ If equipped } Exhaust Aftertreatment Monitor Enabled	No	This parameter displays the status of the Exhaust Aftertreatment Monitor. The parameter will display Yes when the Exhaust Aftertreatment Monitor is Enabled.
{ If equipped } Exhaust Aftertreatment Monitor Enabled This Ignition Cycle	No	This parameter displays the status of the Exhaust Aftertreatment Monitor Enabled This Ignition Cycle. The parameter will display Yes when the Exhaust Aftertreatment Monitor is Enabled This Ignition Cycle.
Exhaust Brake Switch	Off	This parameter displays the status of the Exhaust Brake Switch. The parameter will display On when the Exhaust Brake Switch is enabled.
Exhaust Gas Sensor Monitor Complete	Yes/No	This parameter displays the state of Exhaust Gas Sensor Monitor. The parameter displays Yes when the Exhaust Gas Sensor Monitor is complete.
Exhaust Gas Sensor Monitor Complete This Ignition Cycle	Yes/No	This parameter displays the state of Exhaust Gas Sensor Monitor Complete This Ignition Cycle. The parameter displays Yes when the Exhaust Gas Sensor Monitor is Complete This Ignition Cycle.
Exhaust Gas Sensor Monitor Enabled	Yes/No	This parameter displays the status of the Exhaust Gas Sensor Monitor. The parameter will display Yes when the Exhaust Gas Sensor Monitor is Enabled.

Parameter	Value	Description
Exhaust Gas Sensor Monitor Enabled This Ignition Cycle	Yes/No	This parameter displays the status of the Exhaust Gas Sensor Monitor Enabled This Ignition Cycle. The parameter will display Yes when the Exhaust Gas Sensor Monitor is Enabled This Ignition Cycle.
Exhaust Gas Temperature Sensor 1, 2, 3, 4, or 5	°C (°F)	This parameter will display the exhaust temperature before the DPF. When the exhaust temperature is low, the scan tool will display a low temperature. When the exhaust temperature is high, the scan tool will display a high temperature.
Extended Travel Brake Pedal Position Signal	Released	This parameter displays the status of the Extended Travel Brake Pedal Position sensor.
Frozen Reductant – Diagnostic Inhibit	No	This parameter displays Yes if the reductant diagnostic is inoperative due to frozen reductant.
Frozen Reductant – Injection Inhibit	No	This parameter displays Yes if the reductant injection is inoperative due to frozen reductant.
Frozen Reductant – Refill Recognition Inhibit	No	This parameter displays Yes if the reductant refill monitor is inoperative due to frozen reductant.
Fuel Consumed Since Last DPF Regeneration	Liters/Gallons	This parameter displays the amount of fuel consumed since the last DPF regeneration.
Fuel Consumed Since Last DPF Replacement	Liters	This parameter displays the amount of Fuel Consumed Since Last DPF Replacement.
Fuel Consumption Rate	L/H	This parameter displays the amount of fuel consumed by engine per unit of time in liters per hour. NOTE: Engine Fuel Rate shall indicate zero L/H when the engine is not running.
Fuel Economy Mode Switch	OK / Okay , Malfunction	This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is open.
Fuel Economy Mode Switch	Volts	This parameter displays the economy mode switch reference voltage.
Fuel Filter Life Remaining	%	This parameter displays the fuel filter life remaining before requiring an fuel filter change. This number is calculated by the control module based on many inputs and is displayed as a percent. The lower the percentage, the sooner the next fuel filter change will be required.
Fuel Filter Pressure Switch	OK / Okay , Malfunction	This parameter displays the status of the fuel filter pressure switch.
Fuel Heater Relay Command	Off	This parameter displays the status of the fuel relay heater command.
Fuel Heater Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the fuel heater relay control circuit. The parameter displays Malfunction if the fuel heater relay control circuit is shorted to voltage.
Fuel Heater Relay Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the fuel heater relay control circuit. The parameter displays Malfunction if the fuel heater relay control circuit is shorted to ground.

Parameter	Value	Description
Fuel Heater Relay Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the fuel heater relay control circuit. The parameter displays Malfunction if the fuel heater relay control circuit is open.
Fuel Injection Mode	Normal, Homogeneous Combustion Mode, Particulate Filter Regeneration with High Oxygen Concentration, Fuel Injection Small Quantity Learn, Fuel Injection Small Quantity Learn, Particulate Filter Regeneration with Low Oxygen Concentration, NOx Adsorber Catalyst Regeneration, Lean SOx Adsorber Catalyst Regeneration, Rich SOx Adsorber Catalyst Regeneration, Inhomogeneous Combustion Mode, NOx Catalyst Heating Mode 1, NOx Catalyst Heating Mode 2, Park or Neutral Gear DPF Regeneration, Rich Idle DPF Regeneration, Engine Protection High Oxygen Concentration DPF Regeneration, Engine Protection Low Oxygen Concentration DPF Regeneration, Engine Protection SOx Adsorber Catalyst Regeneration, NOx Catalyst Heating Mode 3, Fuel Injection Small Quantity Learn Combustion Mode, Hydrocarbon Purge Combustion Mode, Park or Neutral Gear Hydrocarbon Purge Combustion Mode, Reductant System Malfunction Warning Service Bay Test Warm Up Combustion Mode, Reductant System Malfunction Warning Service Bay Test Combustion Mode, SOx Purge Combustion Mode, Emissions Combustion Mode, Fast Exhaust System Warm-Up, Exhaust System Warm-Up	This parameter indicates which of the injection modes that currently is active.
Fuel Level Sensor	Volts	This parameter displays the voltage from the sensor used to monitor the fuel level inside the fuel tank.
Fuel Level Sensor Rear Tank	Volts	This parameter contains the unfiltered fuel level sensor analog input for the secondary fuel tank as a percentage of its reference voltage.
Fuel Pressure Sensor	kPa (psi)	For Port Fuel Injected (PFI) systems, this parameter displays undefaulted fuel rail pressure at the engine. For high pressure fuel systems, this parameter indicates the undefaulted low side fuel pressure before the high pressure pump.
Fuel Pressure Sensor	Volts	This parameter contains the fuel supply pressure sensor analog input as a percentage of its reference voltage.
Fuel Pressure Regulator 1 Command	%	This parameter displays the Fuel Pressure Regulator 1 duty cycle as commanded by the engine control module.
Fuel Pressure Regulator 1 Control Circuit Command	On/Off	This parameter displays the current command of the fuel pressure regulator 1.
Fuel Pressure Regulator 1 Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the Fuel Pressure Regulator 1 Control Circuit High. The parameter displays Malfunction if the Fuel Pressure Regulator 1 Control Circuit High is shorted to voltage.

Parameter	Value	Description
Fuel Pressure Regulator 1 Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the Fuel Pressure Regulator 1 Control Circuit High. The parameter displays Malfunction if the Fuel Pressure Regulator 1 Control Circuit High is shorted to ground.
Fuel Pressure Regulator 1 Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the Fuel Pressure Regulator 1 Control Circuit High. The parameter displays Malfunction if the Fuel Pressure Regulator 1 Control Circuit High is open.
Fuel Pressure Regulator 1 Control Circuit Shorted Test Status	OK / Okay , Malfunction	This parameter displays the status of the output driver for the Fuel Pressure Regulator 1 Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 1 Circuit is shorted.
Fuel Pressure Regulator 1 Control Driver Overtemperature	No	This parameter displays the state of the Fuel Pressure Regulator 1 Control Driver circuit. The parameter displays Yes if the Fuel Pressure Regulator 1 Control Driver Overtemperature is detected.
Fuel Pressure Regulator 1 Current	mA	This parameter displays the actual current for the Fuel Pressure Regulator 1.
Fuel Pressure Regulator 1 High Control Circuit Command	On	This parameter displays the status of the Fuel Pressure Regulator 1 High Control Circuit Command. The parameter displays ON when the Fuel Pressure Regulator 1 High Control Circuit is Commanded ON by the engine control module.
Fuel Pressure Regulator 1 High Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pressure Regulator 1 High Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 1 High Control Circuit is shorted to voltage.
Fuel Pressure Regulator 1 High Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pressure Regulator 1 High Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 1 High Control Circuit is shorted to ground.
Fuel Pressure Regulator 1 High Control Driver Overtemperature	No	This parameter displays the state of the Fuel Pressure Regulator 1 High Control Driver circuit. The parameter displays Yes if the Fuel Pressure Regulator 1 High Control Driver Overtemperature is detected.
Fuel Pressure Regulator 2 Command	%	This parameter displays the Fuel Rail Pressure Regulator 2 duty cycle.
Fuel Pressure Regulator 2 Control Circuit Command	On	This parameter displays the current command of the fuel pressure regulator 2.
Fuel Pressure Regulator 2 Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pressure Regulator 2 Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 2 Control Circuit is shorted to voltage.
Fuel Pressure Regulator 2 Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pressure Regulator 2 Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 2 Control Circuit is shorted to ground.

Parameter	Value	Description
Fuel Pressure Regulator 2 Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pressure Regulator 2 Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 2 Control Circuit is open.
Fuel Pressure Regulator 2 Control Circuit Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the Fuel Pressure Regulator 2 Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 2 Control Circuit is shorted.
Fuel Pressure Regulator 2 Control Driver Overtemperature	No	This parameter displays the state of the Fuel Pressure Regulator 2 High Control Driver circuit. The parameter displays Yes if the Fuel Pressure Regulator 2 High Control Driver Overtemperature is detected.
Fuel Pressure Regulator 2 High Control Circuit Command	On/Off	This parameter displays the status of the Fuel Pressure Regulator 2 High Control Circuit Command. The parameter displays On when the Fuel Pressure Regulator 2 High Control Circuit is Commanded ON by the engine control module.
Fuel Pressure Regulator 2 High Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pressure Regulator 2 High Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 2 High Control Circuit is shorted to voltage.
Fuel Pressure Regulator 2 High Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pressure Regulator 2 High Control Circuit. The parameter displays Malfunction if the Fuel Pressure Regulator 2 High Control Circuit is shorted to ground.
Fuel Pressure Regulator 2 High Control Driver Overtemperature	No	This parameter displays the state of the Fuel Pressure Regulator 2 High Control Driver circuit. The parameter displays Yes if the Fuel Pressure Regulator 2 High Control Driver Overtemperature is detected.
Fuel Pressure Sensor	kPa (psi)	For Port Fuel Injected (PFI) systems, this Parameter displays fuel rail pressure at the engine. For high pressure fuel systems, this Parameter indicates the low side fuel pressure before the high pressure pump.
Fuel Pressure Sensor	Volts	This parameter displays the fuel supply pressure sensor analog input as a percentage of its reference voltage.
Fuel Pump 2 Relay Command	On / Off	This parameter contains several signals associated with the status of the fuel system
Fuel Pump 2 Relay Command	On / Off	This parameter contains the commanded state of the secondary fuel pump output along with the status of its associated short to ground, open circuit, and short to power tests
Fuel Pump 2 Relay Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the secondary fuel pump output along with the status of its associated short to ground, open circuit, and short to power tests

Parameter	Value	Description
Fuel Pump 2 Relay Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the secondary fuel pump output along with the status of its associated short to ground, open circuit, and short to power tests
Fuel Pump 2 Relay Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the secondary fuel pump output along with the status of its associated short to ground, open circuit, and short to power tests
Fuel Pump Driver Control Module Battery Voltage	Volts	This parameter contains the Fuel Tank Zone Module's (FTZM) sensed battery voltage that's being transmitted from FTZM to the ECM over serial data
Fuel Pump Driver Control Module Voltage Signal	Volts	This parameter contains the Fuel Tank Zone Module's (FTZM) sensed Run/ Crank voltage that's being transmitted from FTZM to the ECM over serial data.
Fuel Pump Enable Circuit High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pump Enable Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pump Enable Command	On	This parameter displays the commanded state of the fuel pump output (the output is considered to be commanded ON if its duty cycle is not zero).
Fuel Pump Phase U-V-W Circuits High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the Fuel Tank Zone Module's (FTZM) reported status short to power test
Fuel Pump Phase U-V-W Circuits Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the Fuel Tank Zone Module's (FTZM) reported status of short to ground test
Fuel Pump Phase U-V-W Circuits Open Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the Fuel Tank Zone Module's (FTZM) reported status of open circuit test
Fuel Pump Phase U-V-W Circuits Shorted Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the Fuel Tank Zone Module's (FTZM) reported status of phase-to-phase short test
Fuel Pump Relay Command	On	This parameter displays the commanded state of the fuel pump relay control circuit. The fuel pump relay should be On when the scan tool indicates the Fuel Pump Relay Command is ON. The fuel pump relay should be Off when the scan tool indicates the Fuel Pump Relay Command is OFF.
Fuel Pump Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pump Relay Control Circuit. The parameter displays Malfunction if the Fuel Pump Relay Control Circuit is shorted to voltage.

Parameter	Value	Description
Fuel Pump Relay Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Fuel Pump Relay Control Circuit. The parameter displays Malfunction if the Fuel Pump Relay Control Circuit is shorted to ground.
Fuel Pump Relay Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the Fuel Pump Relay Control Circuit. The parameter displays Malfunction if the Fuel Pump Relay Control Circuit is open.
Fuel Pump Speed	RPM	This parameter contains the fuel pump speed as sensed by the FTZM (Fuel Tank Zone Module).
Fuel Pump Speed Command	RPM	This parameter contains the fuel pump commanded speed determined by the ECM and the speed to which the FTZM (Fuel Tank Zone Module) electronically commutates the brushless fuel pump.
Fuel Pump Speed Too High	Yes / No	This parameter contains signals used within the Fuel Pump Speed Rationality Diagnostic (PSRD).
Fuel Pump Speed Too Low	Yes / No	This parameter contains signals used within the Fuel Pump Speed Rationality Diagnostic (PSRD).
Fuel Pump Trim	%	This parameter displays the adjustments for the fuel pump duty cycle control. This is calculated by comparing the estimated fuel rail pressure to the desired fuel rail pressure. If the short term fuel pump trim consistently deviates from 0, the long term fuel pump trim is adjusted accordingly.
Fuel Rail Pressure Regulator 1 Command	%	This parameter contains the commanded duty cycle for the fuel pressure regulator 1 solenoid output.
Fuel Rail Pressure Sensor	MPa (psi)	This parameter displays the fuel rail pressure as calculated by the control module. This value is calculated based on engine speed, engine load, and sensor inputs. The scan tool will display a higher value at higher engine speeds and loads, and a lower value at idle.
Fuel Rail Pressure Sensor	Volts	This parameter displays the voltage signal sent to the control module from the sensor used to measure the fuel rail pressure. The scan tool will display a low voltage at idle and high voltage when pressure demands are high.
Fuel Rail Temperature Sensor	°C (°F)	This parameter displays the current fuel rail temperature.
Fuel System Monitor Complete	Yes	This parameter displays the status of the Fuel System Monitor. The scan tool displays Yes when test is completed.
Fuel System Monitor Complete This Ignition Cycle	Yes	This parameter displays the state of the Fuel System Monitor Complete This Ignition Cycle. The parameter displays Yes when the Fuel System Monitor is Complete This Ignition Cycle.
Fuel System Monitor Enabled	Yes	This parameter displays the status of the Fuel System Monitor. The parameter will display Yes when the Fuel System Monitor is Enabled.

Parameter	Value	Description
Fuel System Monitor Enabled This Ignition Cycle	Yes/No	This parameter displays the status of the Fuel System Monitor Enabled This Ignition Cycle. The parameter will display Yes when the Fuel System Monitor is Enabled This Ignition Cycle.
Fuel Tank Rated Capacity	Liters	This parameter displays the capacity of the fuel tank in liters or gallons. The rated capacity displayed by the scan tool will vary with vehicle type.
Fuel Temperature Sensor	°C (°F)	This parameter displays the current fuel temperature as calculated by the control module based on input from the fuel temperature sensor. The scan tool will display a higher value at higher fuel temperatures. The scan tool will display a lower value at lower fuel temperatures.
Fuel Trim	Mm3/stk	This parameter displays the Fuel Mass Observer (FMO) correction value.
Fuel Trim	Allowed	This parameter displays the status of the Fuel Mass Observer (FMO) system.
Fuel Trim Enabled	Yes	This parameter indicates that the fuel mass observer functionality is enabled.
Fuel Trim Learn	Enabled	This parameter displays the status of the Fuel Mass Observer (FMO) system.
Fuel Used Since Last DPF Regeneration	Liters/Gallons	This parameter will display the amount of fuel used since last regeneration of the exhaust particulate filter.
Generator F-Terminal Signal	%	This parameter indicates the generator field duty cycle as commanded by the voltage regulator or control module. The scan tool will display a higher value for a higher commanded generator output, and a lower value for a lower commanded generator output.
Generator L-Terminal Circuit High Voltage Test Status	OK / Okay , Incomplete, Short B+/Open, Short Gnd	This parameter displays the diagnostic state of the Generator L-Terminal circuit. The scan tool will display OK / Okay, Incomplete, Short B+/Open, Short Gnd. The scan tool will display OK / Okay if the circuit is operating correctly.
Generator L-Terminal Circuit Low Voltage Test Status	OK / Okay , Incomplete, Short B+/Open, Short Gnd	This parameter displays the diagnostic state of the Generator L-Terminal circuit. The scan tool will display OK / Okay, Incomplete, Short B+/Open, Short Gnd. The scan tool will display OK / Okay if the circuit is operating correctly.
Generator L-Terminal Circuit Open Test Status	OK / Okay , Incomplete, Short B+/Open, Short Gnd	This parameter displays the diagnostic state of the Generator L-Terminal circuit. The scan tool will display OK / Okay, Incomplete, Short B+/Open, Short Gnd. The scan tool will display OK / Okay if the circuit is operating correctly.
Generator L-Terminal Command	%	This parameter displays the control modules commanded state of the voltage regulator on the generator.
Generator L-Terminal Signal Command	On/Off	This parameter displays the signal command of the Generator L-Terminal.
Glow Plug Command	On/Off	This parameter displays the voltage supply to the glow plugs as measured by the control module. The scan tool will display a higher value at high voltages, or a lower value at lower voltages.

Parameter	Value	Description
High Idle Speed	Enabled/Disabled	This parameter displays the current state of the High Idle Speed.
HO2S 1	Lambda	This parameter displays the actual lambda signal measured by wide range oxygen sensor 1 bank 1.
H02S 1 Heater Command	On/Off	This parameter displays the current command of the oxygen sensor heater control.
H02S 1 Heater Command	%	This parameter displays the current command of the oxygen sensor heater control in percentage.
H02S 1 Heater Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
H02S 1 Heater Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
H02S 1 Heater Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is open.
H02S 1 Module Signal	Volts	This parameter displays the current voltage of the oxygen sensor heater module signal circuit.
IAT Sensor 1	°C (°F)	This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high.
IAT Sensor 2	°C (°F)	This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor 2. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high.
IAT Sensor 2	Hz	This parameter displays the frequency of the humidity sensors' intake air temperature (IAT) sensor input to the engine control module.
IAT Sensor 3	°C (°F)	This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor 3. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high.
Ignition 1 Signal	On/Off	This parameter displays On when the control module detects B+ voltage at the ignition 1 input terminal.

Parameter	Value	Description
Ignition Accessory Signal	Off	This parameter displays the state of the ignition 0 input to the control module from the ignition switch. The scan tool will display On when the ignition switch is in the ignition accessory position. The scan tool will display Off when the ignition switch is in any other position.
Ignition Cycles with Malfunction Since 1st Malfunction	Counts	This parameter displays the number of ignition cycles with a malfunction detected since the first ignition cycle with a malfunction detected.
Ignition Cycles without Completed Test Since 1st Malfunction	Counts	This parameter displays the number of ignition cycles without a pass or a malfunction reported since the first ignition cycle with a malfunction reported.
Ignition Cycles without Malfunction Since Last Malfunction	Counts	This parameter displays the number of ignition cycles with a pass reported and no malfunctions reported since the first ignition cycle with a malfunction reported.
Immobilizer Auto Learn Counter	Counts	This parameter displays the number of auto learn cycles that have been successfully completed within the immobilizer system.
Immobilizer Automatic Learn Timer	hh:mm:ss	This parameter indicates that either the auto learn timer (used in the auto learn procedure to enable VTD password learning) or the seed and key timer (used in the seed and key procedure to enable VTD password learning) is active.
Immobilizer Password Learn	Disabled	This indicates learning of the Immobilizer password received from the platform electronics is enabled. Immobilizer password learning is first enabled in assembly plant (prior to the manufacturer's enable counter being set to zero) may be re-enabled using 1 of 2 procedures.
Immobilizer Password Learn Scan Tool Delay	Active/Inactive	Scan Tool Learn Delay Active indicates that the security code has been accepted but the scan tool learn delay is active and will not allow learning enabled, programming security code, or resetting security code.
Immobilizer Security Code Accepted	Yes	This parameter displays if the Immobilizer Security code was accepted by the ECM.
Immobilizer Security Code Function	Present	This parameter displays if the immobilizer security code was supported by the ECM.
Immobilizer Security Code Lockout	Inactive	This parameter displays if the Immobilizer Security code is locked out of the ECM.
Immobilizer Security Code Programmed	Yes	This parameter displays if the Immobilizer Security code is currently being programmed in the ECM.
Immobilizer Security Information Programmed	Yes	This parameter displays if the Immobilizer Security code has been programmed in the ECM.
Immobilizer System Status	Varies	This parameter displays the Immobilizer System status in the BCM.
Immobilizer Valid Response Received Time	ms	This parameter displays the actual time observed for a valid immobilizer response.
Induction System Leak Indication	:1	This parameter contains the ratio of desired intake air flow and the actual intake air flow as determined by the mass air flow (MAF) sensor.

Parameter	Value	Description
Injector Timing	°	Indicates the current timing of the main injection pulse as calculated by the control module. The scan tool will display a higher value for a main injection event farther from top dead center (TDC). The Scan tool will display a lower value for a main injection event closer to TDC.
Inspection/Maintenance Drive Cycle Complete	No	Inspection/Maintenance Drive Cycle Complete means that all required components of the standard drive cycle have completed.
Inspection/Maintenance Drive Cycle Idle Time Complete	No	Inspection/Maintenance Drive Cycle Idle Time Complete indicates that the engine idle time requirement is complete.
Inspection/Maintenance Drive Cycle Idle Timer	hh:mm:ss	This parameter displays the Inspection/ Maintenance Drive Cycle Idle Timer.
Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete	No	This parameter displays the Inspection/ Maintenance Drive Cycle Propulsion System Active Time Complete. The parameter displays Yes when the Inspection/Maintenance Drive Cycle Propulsion System Active Time is Complete.
Inspection/Maintenance Drive Cycle Propulsion System Active Timer	hh:mm:ss	This parameter displays the total accumulated time in which the propulsion system has been active after the 1st time the engine is started.
Inspection/Maintenance Drive Cycle Vehicle Speed Time Complete	No	This parameter displays Yes when the Vehicle Speed Time Complete indicates that the vehicle has been above 25 mph for five minutes.
Inspection/Maintenance Drive Cycle Vehicle Speed Timer	hh:mm:ss	This parameter displays the total accumulated time in which the vehicle speed has been greater than 25 mph after the 1st time the engine is started.
Intake Air Flow Valve Control Circuit 1 High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the Intake Air Flow Valve Control Circuit 1 output driver. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is a short to voltage in the circuit.
Intake Air Flow Valve Control Circuit 1 Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the Intake Air Flow Valve Control Circuit 1 output driver. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is a short to ground in the circuit.
Intake Air Flow Valve Control Circuit 2 High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the Intake Air Flow Valve Control Circuit 2 output driver. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is a short to voltage in the circuit.

Parameter	Value	Description
Intake Air Flow Valve Control Circuit 2 Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the Intake Air Flow Valve Control Circuit 2 output driver. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is a short to ground in the circuit.
Intake Air Flow Valve Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the Intake Air Flow Valve Control Circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Intake Air Flow Valve Control Circuit Shorted Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the Intake Air Flow Valve Control Circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is a short in the circuit.
Intake Air Flow Valve Control Driver Overcurrent	No	This parameter displays the status of the Intake Air Flow Valve Control driver. The scan tool will display Yes when an overcurrent is detected.
Intake Air Flow Valve Control Driver Overtemperature	No	This parameter displays the status of the Intake Air Flow Valve Control driver. The scan tool will display Yes when overtemperature is detected.
Intake Air Flow Valve Control Driver Temperature Dependent Overcurrent	No	This parameter displays the status of the Intake Air Flow Valve Control driver. The scan tool will display Yes when Temperature Dependent Overcurrent is detected.
Intake Air Flow Valve Control Driver Undervoltage	No	This parameter displays the status of the Intake Air Flow Valve Control driver. The scan tool will display Yes when Undervoltage is detected.
Intake Air Flow Valve Learned Closed Position	%	This parameter displays the minimum position learned for Intake Air Flow Valve position sensor when the Intake Air Flow Valve is closed.
Intake Air Flow Valve Motor Command	%	This parameter displays the commanded duty cycle for the Intake Airflow Valve output.
Intake Air Flow Valve Position	%	This parameter displays the position determined from Intake Air Flow Valve position sensor (corrected based upon its learned minimum position).
Intake Air Flow Valve Position Sensor	Volts	This parameter displays the Intake Air Flow Valve position sensor voltage input.
Intake Air Heater Command	On/Off	This parameter displays the current status of the Intake Air Heater.
Intake Air Heater Command	%	This parameter displays the current status of the Intake Air Heater in percentage.
Intake Air Humidity Sensor	%	This parameter displays the percentage of humidity at the intake air sensor.

Parameter	Value	Description
Intake Manifold Pressure	kPa	This parameter displays the engine intake manifold vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and intake manifold absolute pressure (MAP).
Intake Manifold Runner Control Valve Command	%	This parameter displays the current command in percentage of the intake manifold runner control valve.
Intake Manifold Runner Control Valve Diagnostic Test Status	Varies	This parameter displays the current phase of the intake manifold runner control valve diagnostic test.
Intake Manifold Runner Control Valve Feedback Signal	%	This parameter displays the current command in percentage of the intake manifold runner control valve feedback signal.
Intake Manifold Runner Control Valve Position	Open, Intermediate, Closed	This parameter displays the current position of the intake manifold runner control valve.
Low Engine Oil Level Indicator Command	Off	This parameter displays the Engine Oil Level Low Indicator Command. The scan tool displays ON in order to inform the driver of a low engine oil level condition.
Low Engine Oil Pressure Indicator Command	Off	This parameter displays the Low Engine Oil Indicator Command. The scan tool displays ON in order to inform the driver of a low engine oil pressure condition.
MAF Sensor	g/s	This parameter indicates the quantity calculated by the control module based on a signal from the MAF sensor. The scan tool will display a high value at high engine speeds, and a low value at low engine speeds.
MAF Sensor	Hz	This parameter indicates the frequency signal received from the MAF sensor by the control module. The scan tool will display a high value at high engine speeds, and a low value at low engine speeds.
MAF When Engine Overspeed Detected	g/s	This parameter indicates the quantity calculated by the control module based on a signal from the MAF sensor at the time an overspeed was detected.
Main-Injection	Inactive	Main Injection Active indicates that main injection is active.
MAP Sensor	Volts	This parameter indicates the voltage signal received by the control module from the MAP sensor. The scan tool displays a low voltage at idle, and a high voltage at wide open throttle. Barometric pressure and altitude can affect these values.
MAP Sensor	kPa (psi)	This parameter displays the actual engine intake manifold absolute pressure (MAP).
MIL Command	Off	This parameter displays the commanded state of the malfunction indicator lamp (MIL) control circuit by the engine control module.
MIL Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to voltage.

Parameter	Value	Description
MIL Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to ground.
MIL Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is open.
MIL Requested	No	This parameter displays the commanded state of the malfunction indicator lamp (MIL) control circuit by the engine control module.
MIL Requested by DTC	No	This parameter indicates the reason the control module illuminated the MIL. The scan tool will display Yes when the MIL is requested as a result of an A or B type DTC. The scan tool will display No if the MIL is illuminated for another reason, such as transmission DTCs.
Misfire Diagnostic Engine Speed	RPM	This parameter displays the engine speed used within the misfire diagnostic. This engine speed is the maximum engine speed observed over the previous engine cycle.
Misfire Monitor Complete	No	This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Complete.
Misfire Monitor Complete This Ignition Cycle	Varies	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
Misfire Monitor Enabled	No	This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Enabled.
Misfire Monitor Enabled This Ignition Cycle	Varies	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
Neutral Position Sensor	%	This parameter displays the current state of the neutral position sensor in degrees.
NOx Catalyst Efficiency	%	This parameter displays the actual average Selective Catalyst Reduction (SCR) efficiency for urea quality determination.
NOx Catalyst Efficiency Gross Error Test	%	This parameter displays the actual average Selective Catalyst Reduction (SCR) efficiency for urea quality determination during the gross error test.
NOx Catalyst Reductant Load	g	This parameter contains the NH3 (Ammonia) storage in the SCR (Selective Catalyst Reduction) system in terms of gram.
NOx Catalyst Reductant-Load Adaptive Value	#	This parameter displays the phrase of the Pressure Control Valve (PCV) test results.
NOx Catalyst Reductant-Load Variance	g	This parameter displays the absolute difference between the targeted and estimated load in the SCR system in terms of grams.
NOx Catalyst System Malfunction Warning Indicator Command	1–7	This parameter displays the Non-Tamper SCR warning command.

Parameter	Value	Description
NOx Sensor 1 Heater Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 1 Heater Circuit. The parameter displays Malfunction if the NOx Sensor 1 Heater Circuit is open.
NOx Sensor 1 Heater Circuit Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 1 Heater Circuit . The parameter displays Malfunction if the NOx Sensor 1 Heater Circuit is shorted.
NOx Sensor 1 Heater Command	Off	This parameter displays the state of the control circuit for NOx Sensor 1 Heater as commanded by the engine control module.
NOx Sensor 1 Heater Mode	Varies	This parameter displays the status of the NOx Sensor 1 Heater.
NOx Sensor 1 Heater Operation	Allowed	This parameter displays the state of the NOx Sensor 1 Heater Operation. The parameter displays Allowed when commanded by the engine control module.
NOx Sensor 1 Heater Resistance	Ω	This parameter displays the resistance value of the NOx sensor 1 heater.
NOx Sensor 1 NOx Concentration	ppm	This parameter displays the concentration of NOx in the exhaust gas.
NOx Sensor 1 NOx Signal Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 1 NOx Signal Circuit. The parameter displays Malfunction if the NOx Sensor 1 NOx Signal circuit is open.
NOx Sensor 1 NOx Signal Circuit Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 1 NOx Signal Circuit. The parameter displays Malfunction if the NOx Sensor 1 NOx Signal circuit is shorted.
NOx Sensor 1 Oxygen Concentration	%	This parameter displays the concentration of Oxygen in the exhaust gas from NOx sensor 1.
NOx Sensor 1 Oxygen Signal Circuit 1 Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 1 Oxygen Signal Circuit 1. The parameter displays Malfunction if the NOx Sensor 1 Oxygen Signal Circuit 1 is open.
NOx Sensor 1 Oxygen Signal Circuit 1 Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 1 Oxygen Signal Circuit 1. The parameter displays Malfunction if the NOx Sensor 1 Oxygen Signal Circuit 1 is shorted.
NOx Sensor 1 Oxygen Signal Circuit 2 Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 1 Oxygen Signal Circuit 2. The parameter displays Malfunction if the NOx Sensor 1 Oxygen Signal Circuit 2 is open.
NOx Sensor 1 Oxygen Signal Circuit 2 Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 1 Oxygen Signal Circuit 2. The parameter displays Malfunction if the NOx Sensor 1 Oxygen Signal Circuit 2 is shorted.
NOx Sensor 2 Heater Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 2 Heater Circuit 2. The parameter displays Malfunction if the NOx Sensor 2 Heater Circuit is open.
NOx Sensor 2 Heater Circuit Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 2 Heater Circuit 2. The parameter displays Malfunction if the NOx Sensor 2 Heater Circuit is shorted.

Parameter	Value	Description
NOx Sensor 2 Heater Command	Off	This parameter displays the state of the control circuit for NOx Sensor 2 Heater as commanded by the engine control module.
NOx Sensor 2 Heater Mode	Varies	This parameter displays the status of the NOx Sensor 2 Heater.
NOx Sensor 2 Heater Operation	Allowed	This parameter displays the state of the NOx Sensor 2 Heater Operation. The parameter displays Allowed when commanded by the engine control module.
NOx Sensor 2 Heater Resistance	Ω	This parameter displays the resistance value of the NOx sensor 1 heater.
NOx Sensor 2 NOx Concentration	ppm	This parameter displays the concentration of NOx in the exhaust gas from NOx sensor 2.
NOx Sensor 2 NOx Signal Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 2 NOx Signal Circuit . The parameter displays Malfunction if the NOx Sensor 2 NOx Signal Circuit is open.
NOx Sensor 2 NOx Signal Circuit Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 2 NOx Signal Circuit . The parameter displays Malfunction if the NOx Sensor 2 NOx Signal Circuit is shorted.
NOx Sensor 2 Oxygen Concentration	%	This parameter displays the concentration of Oxygen in the exhaust gas from NOx sensor 2.
NOx Sensor 2 Oxygen Signal Circuit 1 Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 2 Oxygen Signal Circuit 1. The parameter displays Malfunction if the NOx Sensor 2 Oxygen Signal Circuit 1 is open.
NOx Sensor 2 Oxygen Signal Circuit 1 Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 2 Oxygen Signal Circuit 1. The parameter displays Malfunction if the NOx Sensor 2 Oxygen Signal Circuit 1 is shorted.
NOx Sensor 2 Oxygen Signal Circuit 2 Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 2 Oxygen Signal Circuit 2. The parameter displays Malfunction if the NOx Sensor 2 Oxygen Signal Circuit 2 is open.
NOx Sensor 2 Oxygen Signal Circuit 2 Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the NOx Sensor 2 Oxygen Signal Circuit 2. The parameter displays Malfunction if the NOx Sensor 2 Oxygen Signal Circuit 2 is shorted.
Number of Completed DPF Regenerations	Counts	This parameter displays the number of successful DPF regenerations.
Number of DTC(s)	Counts	This parameter displays the number of emission related DTCs stored in the ECM.
Odometer When Engine Overspeed Detected	km/miles	This parameter displays the kilometers or miles of the Odometer When Engine Overspeed Detected.
Output Shaft Speed Sensor	RPM	This parameter displays the transmission output speed.
PTO	Active / Inactive	This parameter contains an indication that power take off (PTO) is active

Parameter	Value	Description
PTO Engine Shutdown Signal	Yes / No	This parameter contains several signals associated with the status of the power take off (PTO) and fast idle systems.
Park/Neutral Position Switch	Park/Neutral/In Gear	This parameter indicates the range selection of the automatic transmission as calculated by the control module based on input from the park/neutral position (PNP) switch. The scan tool will display, In Gear, Park, or Neutral depending on the PNP switch position.
Particulate Matter Sensor	Mg/m3	This parameter displays the mass concentration of exhaust particulate matter measured by the particulate matter sensor.
Particulate Matter Sensor	uA	This parameter displays the measured current from the sensing element of the particulate matter sensor.
Particulate Matter Sensor Control Unit Communication Status	Ready	This parameter displays the communication status of the particulate matter sensor control unit.
Particulate Matter Sensor Identifier	#	This parameter displays the value sent from the sensor control unit to engine control module to provide sensor build information in order for the software to compensate for sensor variations.
Particulate Matter Sensor Measurement	Active	This parameter displays the status of the particular matter sensor.
Particulate Matter Sensor Operation	Allowed	This parameter displays if the exhaust temperature dew point is reached to allow the particulate matter sensor to operate.
Particulate Matter Sensor Regeneration	Inactive	This parameter displays Active when the particulate matter sensor is regenerating.
Particulate Matter Sensor Status	Ready	This parameter displays the status of the particulate matter sensor.
Particulate Matter Sensor Temperature	°C (°F)	This parameter displays the current temperature of the particulate matter sensor in Celsius and Fahrenheit.
Pilot Injection	Inactive	Pilot Injection Active indicates that pilot injections are active.
Positive Crankcase Ventilation Heater Command	On/Off	This parameter displays the current command of the positive crankcase ventilation heater.
Positive Crankcase Ventilation Heater Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the positive crankcase heater control circuit. The parameter displays Malfunction if the positive crankcase heater control circuit is shorted to voltage.
Positive Crankcase Ventilation Heater Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the positive crankcase heater control circuit. The parameter displays Malfunction if the positive crankcase heater control circuit is shorted to ground.
Positive Crankcase Ventilation Heater Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the positive crankcase heater control circuit. The parameter displays Malfunction if the positive crankcase heater control circuit is open.
Post Injection	Inactive	Post Injection Active indicates that post injections is active

Parameter	Value	Description
Power Mode	Off	This parameter displays the state of the System Power Mode. This signal is based upon the state of the system power mode received over serial communication from the vehicle electronics.
Radiator Coolant Temperature Sensor	°C (°F)	This parameter displays the radiator coolant temperature measured by a sensor located in the coolant outlet of the radiator.
Reduced Engine Power	Inactive	This parameter will display the fuel system status as commanded by the ECM.
Reduced Engine Power History	Varies	This parameter displays the last reason that the engine control module has illuminated the Reduced Engine Power (REP) indication.
Reductant Absolute Pressure	kPa	This parameter displays the absolute pressure of the reductant.
Reductant Fluid Quality Gross Error Test Diagnostics	Varies	This parameter displays the phases of the Selective Catalyst Reduction (SCR) service quality check procedure.
Reductant Fluid Quality Test	Completed with success	This parameter displays the phases of the SCR (Selective Catalyst Reduction) service quality check procedure.
Reductant Fluid Quality Test Diagnostic	Varies	This parameter displays the phases of the Selective Catalyst Reduction (SCR) service quality check procedure.
Reductant Fluid Quality Warning Indicator Command	None	This parameter displays the NOx reductant quality warning.
Reductant Heater 1 Command	On / Off	This parameter contains the commanded state of the reductant heater 1 output (the output is considered to be commanded on if its duty cycle is not zero) along with the status of its associated short to ground (Low side), short to power (Low side), short to ground (High side), short to power (High side) and open circuit tests
Reductant Heater 1 Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the reductant heater 1 output (the output is considered to be commanded on if its duty cycle is not zero) along with the status of its associated short to ground (Low side), short to power (Low side), short to ground (High side), short to power (High side) and open circuit tests
Reductant Heater 1 Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the reductant heater 1 output (the output is considered to be commanded on if its duty cycle is not zero) along with the status of its associated short to ground (Low side), short to power (Low side), short to ground (High side), short to power (High side) and open circuit tests
Reductant Heater 1 Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the reductant heater 1 output (the output is considered to be commanded on if its duty cycle is not zero) along with the status of its associated short to ground (Low side), short to power (Low side), short to ground (High side), short to power (High side) and open circuit tests

Parameter	Value	Description
Reductant Heater 1 Current	Amps	This parameter contains the current feedback for the reductant heater 1 output.
Reductant Heater 1 High Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the reductant heater 1 output (the output is considered to be commanded on if its duty cycle is not zero) along with the status of its associated short to ground (Low side), short to power (Low side), short to ground (High side), short to power (High side) and open circuit tests
Reductant Heater 1 High Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the current feedback for the reductant heater 1 output.
Reductant Heater 2 Command	On / Off	This parameter contains the commanded state of the reductant heater 2 output (the output is considered to be commanded on if its duty cycle is not zero) along with the status of its associated short to ground (Low side), short to power (Low side), short to ground (High side), short to power (High side) and open circuit tests
Reductant Heater 2 Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the reductant heater 2 output (the output is considered to be commanded on if its duty cycle is not zero) along with the status of its associated short to ground (Low side), short to power (Low side), short to ground (High side), short to power (High side) and open circuit tests
Reductant Heater 2 Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the current feedback for the reductant heater 2 output.
Reductant Heater 2 Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter indicates the status of the NOx (Nitrogen Oxides) Reductant Tank.
Reductant Heater 2 Current	Amps	This parameter contains the current feedback for the reductant heater 2 output.
Reductant Heater 2 High Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the reductant heater 2 output (the output is considered to be commanded on if its duty cycle is not zero) along with the status of its associated short to ground (Low side), short to power (Low side), short to ground (High side), short to power (High side) and open circuit tests
Reductant Heater 2 High Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the current feedback for the reductant heater 2 output.
Reductant Heater 1 Request	Off	This parameter displays the commanded state of the Reductant Heater 1. The Reductant Heater 1 should be On when the scan tool indicates the Reductant Heater 1 Command is ON.
Reductant Heater 2 Request	Off	This parameter displays the commanded state of the Reductant Heater 2. The Reductant Heater 2 should be On when the scan tool indicates the Reductant Heater 2 Command is ON.
Reductant Heater 3 Request	Off	This parameter displays the commanded state of the Reductant Heater 3. The Reductant Heater 3 should be On when the scan tool indicates the Reductant Heater 3 Command is ON.

Parameter	Value	Description
Reductant Injection Control Extreme Pressure Test	Passed	This parameter displays the test status of the NOx reductant dosing system extreme pressure test.
Reductant Injection Control Low Pressure Test	Passed	This parameter displays the test status of the NOx reductant dosing system low pressure test.
Reductant Injection Control Overpressure Test Status	Passed	This parameter displays the test status of the NOx reductant closing system overpressure test.
Reductant Injection Control Pressure Build-Up Test Status	Passed	This parameter displays the test status of the NOx reductant dosing system test.
Reductant Injection Inhibit Reason	None	This parameter displays the reasons why the NOx Reductant system has been inhibited from operation.
Reductant Injector Command	%	This parameter displays the commanded duty cycle for the NOx reductant dosing valve output.
Reductant Injector Control Circuit Status	No Malfunction Present	This parameter displays the status of the Reductant Injection Control Circuit output.
Reductant Level	%	This parameter displays the total Reductant level as a percentage of the rated capacity of the tank.
Reductant Level Sensor 1	Inactive	This parameter displays the individual Reductant Level Switch states. Active indicates that the level switch is detecting fluid in regards to its position in the reductant reservoir.
Reductant Level Sensor 1 Circuit Status	No Malfunction	This parameter displays the circuit status of each reductant level sensor.
Reductant Level Sensor 2	Inactive	This parameter displays the individual Reductant Level Switch states. Active indicates that the level switch is detecting fluid in regards to its position in the reductant reservoir.
Reductant Level Sensor 2 Circuit Status	No Malfunction	This parameter displays the circuit status of each reductant level sensor.
Reductant Level Sensor 3	Inactive	This parameter displays the individual Reductant Level Switch states. Active indicates that the level switch is detecting fluid in regards to its position in the reductant reservoir.
Reductant Level Sensor 3 Circuit Status	No Malfunction	This parameter displays the circuit status of each reductant level sensor.
Reductant Level Warning Indicator Command	None	This parameter displays the engine control module (ECM) requested reductant fluid level warning indicator state.
Redundant Odometer Memory	Present/Not Present	This parameter displays if there is a reductant odometer reading present in the control module.
Reductant Pressure	kPa	This parameter displays the engine Reductant pressure from the sensor.
Reductant Pressure Sensor	Volts	This parameter contains the reductant pressure analog input as a percentage of its reference voltage.
Reductant Pump Command	%	This parameter displays the commanded duty cycle for the NOx reductant pump output.

Parameter	Value	Description
Reductant Pump Control Circuit Status	No Malfunction Present	This parameter displays the status of the Reductant Pump Control Circuit.
Reductant Pump Speed	RPM	This parameter contains the actual reductant pump motor speed.
Reductant Purge Solenoid Valve Command	On/Off	This parameter displays the commanded state of the reductant line purge solenoid valve. The scan tool displays On when the reductant line purge solenoid valve is commanded ON.
Reductant Purge Solenoid Valve Control Circuit Status	No Malfunction Present	This parameter displays the status of the Reductant Purge Solenoid Valve Control Circuit.
Reductant Range	km/miles	This parameter displays the Distance that can be driven before the Reductant tank needs to be refilled.
Reductant System Adaption Diagnostic	Varies	This parameter displays the status of the Selective Catalyst Reduction (SCR) adaption check diagnosis.
Reductant System Malfunction Warning Indicator Command	None	This parameter displays the NOx Reductant System Malfunction warning.
Reductant System Malfunction Warning Service Bay Test	Varies	This parameter displays a malfunction warning for the reductant system during a service bay test.
Reductant System Tamper Warning Service Bay Test Abort Reason	Not Requested, In Progress, Passed, Failed, Interrupted	This parameter contains the status of the SCR Tamper/No Tamper service bay test procedure.
Reductant System Tamper Warning Service Bay Test Result	Reductant System Tamper Warning Service Bay Test Result	This parameter holds the most recent abort reason for the SCR Tamper/No Tamper service bay test algorithm
Reductant Tank Level	Varies	This parameter displays the current reductant tank fluid level.
Reductant Tank Temperature 1	ºC (ºF)	This parameter contains the undefaulted reductant temperature measured by a sensor that is located within the holding tank.
Reductant Tank Temperature 2	ºC (ºF)	This parameter contains the undefaulted reductant temperature measured by a sensor that is part of the reductant quality sensor
Reductant Tank Temperature Sensor 2 Circuit Erratic Test Status	Yes / No	This parameter contains the all monitors that trigger the SCR Tamper/Not Tamper Warning Strategy.
Reductant Tank Temperature Sensor 2 Circuit High Voltage Test Status	Yes / No	This parameter contains the all monitors that trigger the SCR Tamper/Not Tamper Warning Strategy.
Reductant Tank Temperature Sensor 2 Circuit Low Voltage Test Status	Yes / No	This parameter contains the all monitors that trigger the SCR Tamper/Not Tamper Warning Strategy.
Reductant Tank Temperature Sensor 2 Circuit Performance Test Status	Yes / No	This parameter contains the all monitors that trigger the SCR Tamper/Not Tamper Warning Strategy.
Reductant Tank Temperature Sensor Circuit Erratic Test Status	Yes / No	This parameter contains the all monitors that trigger the SCR Tamper/Not Tamper Warning Strategy.
Reductant Tank Temperature Sensor Circuit High Voltage Test Status	Yes / No	This parameter contains the all monitors that trigger the SCR Tamper/Not Tamper Warning Strategy.

Parameter	Value	Description
Reductant Tank Temperature Sensor Circuit Low Voltage Test Status	Yes / No	This parameter contains the all monitors that trigger the SCR Tamper/Not Tamper Warning Strategy.
Reductant Temperature	°C (°F)	This parameter displays the Reductant temperature measured by a sensor that is located within the holding tank.
Remaining Reductant in Tank	g	This parameter displays the current reductant remaining in the holding tank.
Remaining Fuel in Tank	%	This parameter displays the total fuel level as a percentage of the rated capacity of the fuel tank.
Remaining Fuel in Tank	Liters	This parameter displays the actual total fuel volume contained in the fuel tank.
Remote Vehicle Start Disable History 1–8	Reason for RVS Disable	These parameters display the last eight reasons the control module disabled remote vehicle start (RVS).
Remote Vehicle Start Request Signal	Off	Remote Vehicle Start Request indicates the state of the request received over serial communication from the remote vehicle start (RVS) system to start the vehicle in remote mode.
Replicated Transmission OSS Signal	RPM	This parameter displays the Replicated Transmission Output Speed (Replicated TOS) received from the Transmission Control Module.
Sensor Reference	Volts	This parameter displays the voltage sensed on the 5 V reference circuits at the control module. The scan tool will display a higher value at higher voltage. The scan tool will display a lower value at lower voltage.
Sensor Reference 2-4	Volts	This parameter displays the voltage sensed on the 5 V reference circuits at the control module. The scan tool will display a higher value at higher voltage. The scan tool will display a lower value at lower voltage.
Sensor Reference Circuit Status	OK / Okay, Malfunction	This parameter will display OK / Okay if the circuit is good or Malfunction if a short to ground, or short to B+ is present.
Sensor Reference 2-4 Circuit Status	OK / Okay, Malfunction	This parameter will display OK / Okay if the circuit is good or Malfunction if a short to ground, or short to B+ is present.
Sensor Supply Voltage Relay Command	On / Off	This parameter contains the exhaust gas recirculation cooler temperature at power-up (Run/Crank transition from low to high) from a sensor that is located before the inlet of the exhaust gas recirculation cooler heat exchanger.
Soot Mass Correction	#	This parameter displays the soot mass correction value caused by Continuous Regenerating Trap (CRT) effect.
Specific Humidity	%	This parameter displays the current specific humidity in percentage.
Start-Up Charge Air Cooler Temperature	°C (°F)	This parameter displays the current start-up charge air cooler temperature.

Parameter	Value	Description
Start-Up Charge Air Cooler Inlet Temperature	ºC (ºF)	This parameter contains the charge air temperature (measured by a sensor that is located first in the charge air cooler stream in relationship to any other charge air cooler temperature sensors in the system.) recorded at power-up.
Start-Up Charge Air Cooler Outlet Temperature	ºC (ºF)	This parameter contains the charge air temperature (measured by a sensor that is located second in the charge air cooler stream in relationship to any other charge air cooler temperature sensors in the system.) recorded at power-up.
Start-Up Temperature EGR Cooler Temperature Sensor 1	ºC (ºF)	This parameter contains the exhaust gas recirculation cooler temperature at power-up (Run/Crank transition from low to high) from a sensor that is located before the inlet of the exhaust gas recirculation cooler heat exchanger.
Start-Up Temperature EGR Cooler Temperature Sensor 2	ºC (ºF)	This parameter contains the exhaust gas recirculation cooler temperature at power-up (Run/Crank transition from low to high) from a sensor that is located on the outlet of the exhaust gas recirculation cooler heat exchanger.
Start-Up ECT	°C (°F)	This parameter Indicates the engine coolant temperature at engine start up as calculated by the control module based on the signal from the ECT sensor. The scan tool will display a higher value on a warmer engine, and a lower value on a colder engine.
Start-Up Exhaust Gas Temperature Sensor 1, 2, 3, or 4	°C (°F)	This parameter displays the current start-up exhaust gas temperature for sensor 4.
Start-Up Fuel Temperature	°C (°F)	This parameter Indicates the fuel temperature at engine start up as calculated by the control module based on the signal from the fuel temperature sensor. The scan tool will display a higher value on a warmer fuel, and a lower value on a colder fuel.
Start-Up IAT Sensor 1–3	°C (°F)	This parameter indicates the intake air temperature at engine start up as calculated by the control module based on the signal from the IAT sensor. The scan tool will display a higher value during warmer under hood temperatures, and a lower value during colder under hood temperatures.
Start-Up Particulate Matter Sensor Temperature	°C (°F)	This parameter displays the start-up particulate matter temperature in Celsius and Fahrenheit.
Starter Relay Command	Off	The scan tool displays ON/OFF. The scan tool displays Off until the ignition is placed into the CRANK position, then it reads On.
Starter Relay Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the relay control circuit ON.

Parameter	Value	Description
Starter Relay Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the relay control circuit ON.
Starter Relay Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is open. This parameter may not change if the scan tool is used to command the relay control circuit ON.
Starter Motor Relay Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the starter relay output along with the status of its associated short to ground, open circuit, and short to power tests
Starter Motor Relay Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the starter relay output along with the status of its associated short to ground, open circuit, and short to power tests
Starter Motor Relay Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the commanded state of the starter relay output along with the status of its associated short to ground, open circuit, and short to power tests
TCC Control	Disengaged	This parameter displays the current state of the TCC.
Torque Delivered Signal	N•m	This parameter displays the engine torque based upon the airflow through the engine and the torque losses due to fuel shutoff. Since this is a steady state engine torque, it does not include the inertial component of engine torque.
Total Fuel Consumed	Liters	This parameter displays the fuel consumed in the current drive cycle in liters.
Total Misfire	Counts	This parameter displays the total number of cylinder firing events that the control module detected as misfires for the last 200 crankshaft revolution sample period.
Tow/Haul Mode	Active / Inactive / Not Available	This parameter contains signals associated with Tow Haul Mode as selected by the driver mode determination (DMD) switches
Traction Control Status	Inactive	This parameter displays Active if the electronic brake and traction control module (EBTCM) is commanding traction control.
Traction Control Torque Delivered Signal	%	This parameter displays the estimated engine torque delivered by the powertrain, as a percentage of maximum engine torque that is provided to the ABS/TCS module.
Traction Control Torque Request Signal	%	This parameter displays the engine torque requested by the traction control system, as a percentage of maximum engine torque.
Transmission Inhibiting Engine Cranking	Yes / No	This parameter contains several signals associated with the status of the power mode and starter systems

Parameter	Value	Description
Turbocharger Control Module Supply Voltage	Volts	This parameter contains the undefaulted voltage applied to the turbocharger actuator power supply pins.
Turbocharger Vane Learned Closed Position	%	This is the learned position of the blades that control the airflow into the turbo charger. This parameter displays the learned closed position.
Turbocharger Van Learned Closed Position	Volts	This parameter displays the minimum position learned for Turbo Charger Vane position sensor when the Turbo Charger Vanes are closed.
Turbocharger Vane Learned Open Position	%	This is the learned position of blades that control the airflow into the turbo charger. This parameter displays the learned open position.
Turbocharger Vane Learned Open Position	Volts	This parameter displays the minimum position learned for Turbo Charger Vane position sensor when the Turbo Charger Vanes are open.
Turbocharger Vane Position Learn Status	Learned	This parameter indicates the status of the control module in learning the turbocharger vane position. The scan tool will display No if the turbocharger vane position has not been learned since the last DTC clear.
Turbocharger Vane Position Initial Learned Value	Counts	This parameter contains the end of line (EOL) learn span in commutation counts
Turbocharger Vane Position Learned Value	Counts	This parameter contains the full span learn (FSL) in commutation counts that occurs at ignition off.
Turbocharger Vane Position Sensor	%	This parameter displays the current commanded state of the turbocharger vane position control solenoid valve by the control module. The scan tool will display a higher value as the solenoid is commanded open. The scan tool will display a lower value as the solenoid is commanded closed.
Turbocharger Vane Position Sensor	Volts	This parameter displays the voltage signal sent to the control module from the sensor. The scan tool will display a higher value as the solenoid is commanded open. The scan tool will display a lower value as the solenoid is commanded closed.
Turbocharger Vane Position Solenoid Valve Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Turbocharger Vane Position Solenoid Valve circuit. The parameter displays Malfunction if the Turbocharger Vane Position Solenoid valve circuit is shorted to voltage.
Turbocharger Vane Position Solenoid Valve Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Turbocharger Vane Position Solenoid Valve circuit. The parameter displays Malfunction if the Turbocharger Vane Position Solenoid valve circuit is shorted to ground.
Turbocharger Vane Position Solenoid Valve Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the Turbocharger Vane Position Solenoid Valve circuit. The parameter displays Malfunction if the Turbocharger Vane Position Solenoid valve circuit is open.

Parameter	Value	Description
Turbocharger Vane Position Solenoid Valve Circuit Shorted Test Status	OK / Okay, Malfunction	This parameter displays the state of the Turbocharger Vane Position Solenoid Valve Circuit. The parameter displays Malfunction if the Turbocharger Vane Position Solenoid valve circuit is shorted.
Turbocharger Vane Position Solenoid Valve Command	%	This parameter displays the commanded duty cycle for the solenoid on variable geometry turbocharger.
Turbocharger Vane Position Solenoid Valve Control Circuit Command	Off	This parameter displays the commanded state of the turbocharger solenoid valve.
Turbocharger Vane Position Solenoid Valve Control Driver Overtemperature	No	This parameter displays the state of the turbocharger vane position solenoid valve control driver.
Turbocharger Vane Position Solenoid Valve High Control Circuit Command	Off	This parameter displays the commanded state of the turbocharger solenoid valve high control circuit.
Turbocharger Vane Position Solenoid Valve High Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Turbocharger Vane Position Solenoid Valve high control circuit. The parameter displays Malfunction if the Turbocharger Vane Position Solenoid valve high control circuit is shorted to voltage.
Turbocharger Vane Position Solenoid Valve High Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Turbocharger Vane Position Solenoid Valve high control circuit. The parameter displays Malfunction if the Turbocharger Vane Position Solenoid valve high control circuit is shorted to ground.
Turbocharger Vane Position Solenoid Valve High Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the Turbocharger Vane Position Solenoid Valve high control circuit. The parameter displays Malfunction if the Turbocharger Vane Position Solenoid valve high control circuit is open.
Vehicle Speed Output Circuit 2 High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Vehicle Speed Output circuit 2 control circuit. The parameter displays Malfunction if the Vehicle Speed Output circuit 2 control circuit is shorted to voltage.
Vehicle Speed Output Circuit 2 Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Vehicle Speed Output circuit 2 control circuit. The parameter displays Malfunction if the Vehicle Speed Output Circuit 2 control circuit is shorted to ground.
Vehicle Speed Output Circuit 2 Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the Vehicle Speed Output circuit 2 control circuit. The parameter displays Malfunction if the Vehicle Speed Output circuit 2 control circuit is open.
Vehicle Speed Sensor	km/h/MPH	This parameter indicates the vehicle speed as calculated by the control module based on a signal from the vehicle speed sensor (VSS). The scan tool will display a higher value at higher vehicle speeds, and a lower value at lower vehicle speeds.
Vehicle Speed When Engine Overspeed Detected	Km/h mph	This parameter displays the Vehicle Speed When Engine Overspeed Detected.

Parameter	Value	Description
Wait to Start Indicator Command	On/Off	The wait to start indicator illuminates with the ignition ON and the engine OFF. The wait to start indicator will not illuminate during post-start glow plug operation.
Wait to Start Indicator Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the wait to start indicator control circuit. The parameter displays Malfunction if the wait to start indicator control circuit is shorted to voltage.
Wait to Start Indicator Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the wait to start indicator control circuit. The parameter displays Malfunction if the wait to start indicator control circuit is shorted to ground.
Wait to Start Indicator Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the wait to start indicator control circuit. The parameter displays Malfunction if the wait to start indicator control circuit is open.
Warm-ups Since DTC Cleared	Counts	This parameter indicates the number of warm up cycles that have occurred Since DTCs were cleared. The scan tool will display a higher counts as more warm up cycles have occurred since the DTCs were cleared.
Warm-ups without Emission Malfunctions	Counts	This parameter indicates the number of warm up cycles that have occurred without an emission fault present. The scan tool will display a 0 if a malfunction has occurred. The scan tool will display a higher count if a number of warm up cycles have occurred without an emission malfunction.
Warm-ups without Non-emission Malfunctions	Counts	This parameter indicates the number of warm up cycles that have occurred without a non-emission fault present. The scan tool will display a 0 if a malfunction has occurred. The scan tool will display a higher count if a number of warm up cycles have occurred without a non-emission malfunction.
Water in Fuel	No	This parameter indicates if there is water in the fuel.
Water in Fuel Indicator Command	Off	This parameter indicates if water in the fuel indicator is On or Off.
Water in Fuel Sensor	Volts	This parameter displays the water in fuel sensor voltage input.

Output Control

Parameter	Description
This is a comprehensive list. Not all output controls listed are available for all applications.	
A/C Compressor Clutch Relay	This device control is used to override the state of the air conditioning compressor output.
Ambient Air Temperature Calculation Reset	This device control is used to reset the estimated ambient air temperature value to the current sensor value following a service repair.
BARO Sensor Reset	This device control is used to reset learned barometric pressure values in case of either an ECU or barometric pressure sensor replacement.
Brake Pedal Position Sensor Learn	This device control is used to reset the initialized values for the brake pedal fully released learned position.
Catalyst Reset	This device control is used to reset learned values in case of a diesel oxidation catalyst replacement. The engine must be OFF and Ignition ON.

Parameter	Description
Compression Test Starter Relay	This device control is used to set up the internal combustion engine for a compression test.
Coolant Fill	This device control is used to start an automatic coolant fill service routine that will ensure proper fill and de-aeration of the cooling system.
Cooling Fan Motor	This device control is used to override the state of cooling fan duty cycle control output.
Crankshaft Position Reluctor Ring Learned Values Reset	This device control is used to reset the crank wheel adaptation values in case of an ECU or crank wheel replacement.
Crankshaft Position Variation Learn	This device control is used to activate the crankshaft position variation learn (CASE) algorithm which calculates the reference pulse correction factors for the misfire diagnostic.
Cylinder 1–8 Fuel Injector Correction Value Reset	This device control is to be used to reset the NVC and ZFC values to zero if one or more of the fuel injectors have been replaced.
Cylinder 1–8 Injector Flow Identifier	This device control contains the data that the Engine Control Module will need in order to do proper Injector Fuel Quantity adjustments. If a new ECM is being installed, this data shall be read from the old ECM and transferred to the new ECM. If an injector is replaced, the injector code must be downloaded to the ECM
Cylinder Balance Rate Monitor	This device control is used to enable or disable Cylinder Fuel Balancing.
Cylinder Power Balance	This device control disables each fuel injector at any engine or vehicle speed. The device control will not change unless changed or cancelled by the scan tool.
DPF Pressure Sensor Reset	This device control is used to reset learned values in case of a diesel particulate filter pressure sensor replacement.
DPF Regeneration Enable	This function enables a DPF Regeneration when the vehicle meets the conditions for running. This function will by-pass the normal soot model, so the next time the vehicle is under the conditions for an active regeneration to take place, the ECM will go ahead and initiate the regeneration event. This device control is used to Force the Diesel Particulate Filter to perform regeneration. The Device Control sets an indication in the ECU that the controller shall perform regeneration, the next time the driving condition are met. The Regeneration shall be performed even if the tool is no longer connected to the vehicle.
DPF Regeneration Inhibit	This device control is used to inhibit the Diesel Particulate Filter to perform regeneration, even if the driving conditions are met. The inhibit function shall only work when the tool is connected to the vehicle.
DPF Reset	This device control is used to reset learned values in case of a diesel particulate filter replacement.
DPF Service Regeneration	This device control enables a DPF Regeneration. The engine coolant must be greater than 70–115°C (158–239°F). Vehicle must be in Park. Ambient temperature must be greater than −30°C (−22°F). Brake pedal and accelerator must be in the released position. The scan tool will display all inhibit reasons. The scan tool must remain connected until test is complete. This function takes approximately 35 minutes to complete. During this procedure the RPM will slowly increase to 2,500 RPM and remain there for approximately 25 minutes.
EGR	This device control is used to verify functionality of the Exhaust Gas Recirculation Valve by allowing the Exhaust Gas Recirculation Valve output to be commanded to a specific duty cycle.
EGR Cooler Bypass Motor	This device control is used to verify functionality of the Exhaust Gas Recirculation (EGR) Cooler Bypass Valve system by allowing the EGR Cooler Bypass Valve output to be commanded to a specific position.
EGR Cooler Bypass Valve	This device control is used to verify functionality of the Exhaust Gas Recirculation (EGR) Cooler Bypass Valve system by allowing the EGR Cooler Bypass Valve output to be commanded to a specific position
EGR Valve	This device control is used to verify functionality of the Exhaust Gas Recirculation (EGR) system by allowing the Exhaust Gas Recirculation output to be commanded to a specific lift.
Engine Compression Quick Test	This device control is used to initiate the semi-automatic compression test on Diesel engines.
Engine Controls Ignition Relay	This device control is used to override the state of the Powertrain Relay.
Engine Oil Life Reset	This device control contains the engine oil remaining life determined from a calibration based upon the effective engine revolutions and the distance driven since the last oil change. This device control may be used to reset the engine oil remaining life to 100% after an oil change or to any other value when replacing an engine control module.

Parameter	Description
Engine Oil Pressure Control Solenoid Valve	This device control is used to override the state of the variable displacement oil pump. When the variable displacement oil pump is turned ON, the oil pump will be commanded to a low pressure state.
Engine Speed	This device control is used to override the idle engine speed.
Exhaust Aftertreatment Data Reset	This device control is used to reset the exhaust aftertreatment fuel injector OEM data in case of a replacement.
Exhaust Aftertreatment Fuel Injector	This device control is used to verify functionality of the Exhaust Aftertreatment Fuel Injector by allowing Exhaust Aftertreatment Fuel Injector output to be commanded to a specific duty cycle.
Exhaust Aftertreatment Fuel Injector Cleaning Procedure	This device control is used to trigger the Exhaust Aftertreatment Fuel Injector tip cleaning procedure.
Exhaust Aftertreatment Fuel Injector Flow Test	This device control is used to trigger the Exhaust Aftertreatment Fuel Injector to be commanded on for a calibrateable duration and a calibrateable HC injection quantity in order to test the flow of the injector.
Exhaust Gas Recirculation	This device control is used to verify functionality of the Exhaust Gas Recirculation (EGR) system by allowing the Exhaust Gas Recirculation output to be commanded to a specific lift.
Exhaust Gas Temperature Sensor Reset	This device control is used to reset the SCR (Selective Catalytic Reduction) Temperature Sensor data in case of a replacement.
Fuel Filter Life Reset	This device control resets the fuel filter life remaining to 100%.
Fuel Injection Small Quantity Data Reset	This device control is used to reset the learned values of the small quantity adjustment (SQA) map in case of a fuel rail pressure sensor replacement.
Fuel Injection Small Quantity Learning Odometer Reset	This device control is used to initialize small quantity learn internal odometer to a default value.
Fuel Heater Relay	This device control is used to override the state of the Fuel Filter Heater output.
Fuel Injector Balance	This feature will allow the technician to inspect the fuel system for leaks after servicing the fuel system or after any other service procedure that required disconnection or removal of fuel system components.
Fuel Injector Correction Value Preset	This device control resets all injector NVC and ZFC values to the default value. This device control is to be used if the old ECM values cannot be transferred to the new ECM after replacement.
Fuel Pressure Regulator 1	This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to activate the fuel pressure regulator 1 at ignition ON, engine OFF. Both the low side and high side of the regulator are controlled together. Commanding the regulator to ON will modulate the high side driver to a calibratible “maximum” duty cycle. (Note: As this is an electrical circuit test, a regulator solenoid commanded to ON does not necessarily equate to the regulator state at maximum fuel pressure.)
Fuel Pressure Regulator 2	This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to activate the fuel pressure regulator 2 at ignition ON, engine OFF. Both the low side and high side of the regulator are controlled together. Commanding the regulator to ON will modulate the high side driver to a calibratible “maximum” duty cycle. (Note: As this is an electrical circuit test, a regulator solenoid commanded to ON does not necessarily equate to the regulator state at maximum fuel pressure.)
Fuel Pump Relay	This device control is used to override the state of the fuel pump output.
Fuel Pump 2 Relay	This device control is used to override the state of the electric secondary transfer pump output.
Fuel Rail Pressure	This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to override the commanded fuel high pressure output from the powertrain controller.
Fuel Trim Enable	This device control is used to deactivate the Fuel Mass Observer (FMO).
Fuel Trim Reset	This device control is used to reset the Fuel Mass Observer data in case of a replacement.
Generator L-Terminal	The commanded states are ON and OFF. Selecting OFF commands the ECM to turn OFF the generator and stop generating an output voltage.
High Side Driver 1	This device control is used to override the state of the Shared High Side Driver 1 output.
High Side Driver 2	This device control is used to override the state of the Shared High Side Driver 2 output.
HO2S Heater Sensor 1	This device control is used to override the duty cycle of the oxygen sensor heaters.

Parameter	Description
Intake Air Flow Valve Motor	This function increases or decreases the position of the IAF valve.
Intake Air Flow Valve Position	This parameter displays the actual position of the intake air flow valve.
Intake Manifold Runner Control Valve	This device control is used to override the state of the intake manifold runner control output.
Malfunction Indicator Lamp (MIL)	This device control is used to either turn the Malfunction Indicator Lamp (MIL) on or off.
Misfire Graphic	This device control produces a misfire graphic while the engine is running.
NOx Catalyst Reductant Loading Reset	This device control is used to reset the adaptive values for the SCR (Selective Catalytic Reduction) data.
NOx Catalyst Reset	This device control is used to reset the Selective Catalytic Reduction (SCR) data in case of a replacement.
NOx Sensor 1 Heater- Engine Running	This device control is used to control the duty cycle of the NOx Sensor 1 Heater with the engine running. The Duty Cycle is fixed at a predetermined value and is controlled for a predetermined amount of time.
NOx Sensor 1 Reset	This device control is used to reset the NOx Sensor 1 data in case of a replacement. The engine must be Off and the Ignition On.
NOx Sensor 2 Heater- Engine Running	This device control is used to control the duty cycle of the NOx Sensor 2 Heater with the engine running. The Duty Cycle is fixed at a predetermined value and is controlled for a predetermined amount of time.
NOx Sensor 2 Reset	This device control is used to reset the NOx Sensor 2 data in case of a replacement. The engine must be OFF and the Ignition ON.
Particulate Matter Sensor Service Regeneration	This device control is used to force a particulate matter sensor measurement cycle, consisting of a particulate sensor probe regeneration and subsequent soot accumulation measurement. The system will return to normal control after one measurement cycle is successfully completed. One full measurement cycle can take 15 minutes or more to complete depending up the particulate filter state of health.
Pilot Injection Balance Procedure	This device control disables each fuel injector pilot injection. Device Control can be changed at any engine or vehicle speed. The device control will not change unless changed or cancelled by the scan tool.
Positive Crankcase Ventilation Heater	This device control is used to turn the crankcase ventilation heater output ON or OFF.
Prime Fuel Pump	This device control is used to override the state of the fuel pump output.
Programming History	This device control is used to view the history buffer entries for the primary calibration part in the controller.
Reductant Fluid Quality Test	This device control is used to force a Selective Catalyst Reduction (SCR) Service Quality Check.
Reductant Fluid Tank Level Reset	This device control is used to Reset the Reductant Fluid Tank Level.
Reductant Heater 1	This device control is used to override the state of the Reductant Heater 1. The scan tool disables the test when the following control limits are exceeded. • Reductant System DTC is set. • The exhaust temperature is too low. • Ignition voltage is too low. • Ignition voltage is too high.
Reductant Heater 2	This device control is used to override the state of the Reductant Heater 2.
Reductant Heater 3	This device control is used to override the state of the Reductant Heater 3.
Reductant Injection Quantity Test	This device control is used to inject a specific amount of reductant from the reductant injector. A system purge will be required once the test is complete.
Reductant Injector	This device control is used to verify functionality of the NOx Reductant Injector by allowing NOx Reductant Injector output to be commanded to a specific duty cycle.
Reductant Injector Reset	This device control is used to reset the Reductant Injector variables after the Injector is replaced.
Reductant Pump	This device control is used to verify functionality of the NOx Reductant Pump by allowing NOx Reductant Pump output to be commanded to a specific duty cycle.

Parameter	Description
Reductant Purge	This device control is used to purge the reductant lines of fluid.
Reductant Purge Valve	This device control is used to command the state of the NOx Reductant Line Purge valve.
Reductant System Tamper Warning Service Bay Test	This device control is used to force a SCR (Selective Catalyst Reduction) service bay test.
Reductant System Data Reset	This device control is used to reset the ECM data in case of a replacement.
Reductant System Leak Test	This device control is used to pressurize the reductant system in order to perform a visual inspection for leaks. A system purge will be required once the test is complete.
Reductant System Malfunction Warning Service Bay Test	This device control triggers the Selective Catalytic Reduction (SCR) Tamper Service Bay Test.
Reductant System Reset	This device control is used to reset the Reductant Module data in case of a replacement.
Remote Vehicle Start Disable History Reset	This device control is used to trigger the reset of the last eight reasons that powertrain has disabled remote vehicle start (RVS).
Sensor Supply Voltage Relay	This device control is used to control the sensor bus supply relay.
Starter Relay	This device control is used to override the state of the Starter Relay output. Fuel is disabled to prevent the engine from starting if the starter relay output is commanded On.
Total Fuel Consumed Reset	This device control contains the after treatment related data parameter that needs to be transferred in case of an ECM replacement.
Turbocharger Learn	This device control is used when the Turbocharger assembly, Vane position control solenoid valve, Vane position sensor is replaced, or repairs that disturb turbocharger components.
Turbocharger Vane Position	This device control adjusts the turbocharger vane position in 5 percent increments from 0–100 percent. The device control will be aborted if engine speed is above idle or if the coolant temperature is too cold.
Turbocharger Vane Position Actuator	This device control is used to control the duty cycle for a variable geometry turbocharger .
Turbocharger Vane Position Learn	This device control triggers the Variable Geometry Turbo (VGT) Actuator Learn in the event of a turbocharger or actuator replacement.
Turbocharger Vane Position Solenoid Valve	This device control cycles the turbocharger vane position solenoid to 100 percent boost and back to 0 percent boost. The device control is limited to engine speeds less than 1,500 RPM and will be disabled if DTC P0047 or P0048 are set.
Wait to Start Indicator	This device control is used to turn the Glow Plug (Wait to start) Lamp ON/OFF.

K20 Engine Control Module: Scan Tool Information (L8T)

Engine Control Module Scan Tool Data

Parameter	Value	Description
This is a comprehensive list. Not all parameters listed are available for all applications. **Base Operating Conditions:** Engine Idling/Radiator Hose Hot/Park or Neutral/Closed Loop		
5 V Reference 1, 2, 3, 4 or 5	Volts	This parameter displays the voltage sensed on the 5 V reference circuits at the control module. The scan tool will display a higher value at higher voltage. The scan tool will display a lower value at lower voltage.
5 V Reference 1, 2, 3, 4 or 5 Circuit Status	OK / Okay , Malfunction	This parameter will display OK / Okay if the circuit is good or Malfunction if a short to ground, short to B+ is present.
A/C Compressor Clutch Inhibit Reason History 1 or 2	None	This parameter displays one of the following if an A/C Compressor Clutch Inhibit reasons is detected. High Side Fluid Pressure, Engine Speed, Battery Voltage, Engine Stall, Engine Speed Stabilization, Wide Open Throttle, Vehicle Launch Performance, High Coolant Temperature, AC Relay Fault, Hybrid Request, AutoStop Request, High Power Electronics Coolant Temperature, High Transmission Fluid Temperature, Full Pedal Power Limit Applied, Airbag deployed, Battery Power Limit Exceeded, Powertrain Diagnostics, AC Compressor Fault, Serial Communication Fault, or Low Brake Vacuum.

Parameter	Value	Description
A/C Compressor Clutch Relay Command	Off	This parameter displays when the A/C Compressor Clutch relay is commanded ON or OFF.
A/C Compressor Clutch Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the relay control circuit. It can display OK / Okay, Malfunction or Not Run.
A/C Compressor Clutch Relay Control Circuit Low Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the relay control circuit. It can display OK / Okay, Malfunction or Not Run.
A/C Compressor Clutch Relay Control Circuit Open Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the relay control circuit. It can display OK / Okay, Malfunction or Not Run.
A/C Disabled – A/C Pressure Out of Range	No	This parameter displays whether the A/C pressure is out of range for normal operation as determined by the control module.
A/C Disengage 1–8 History	Reason for A/C Disengagement	The parameter displays reason for the last 8 air conditioning (A/C) compressor disengagements in order from 1 to 8 with 8 being the most recent. There are 8 possible causes for the A/C compressor to disengage.
A/C High Side Pressure Sensor	Volts*	This parameter displays the voltage signal from the A/C high side pressure sensor input to the control module. * Varies with temperature, humidity, and altitude.
A/C High Side Pressure Sensor	kPa (psi)*	This parameter displays the pressure from the A/C high side pressure sensor signal circuit to the control module. * Varies with temperature, humidity, and altitude.
A/C OFF for WOT	No	This parameter displays whether the control module is commanding the A/C compressor clutch relay OFF for wide open throttle (WOT).
A/C Request Signal	No	This parameter displays the state of the A/C request input to the control module from the heating, ventilation, and air conditioning (HVAC) controls.
Accelerator Pedal Position	%	This parameter displays the angle of the accelerator pedal position (APP) as calculated by the control module using the signals from the APP sensors.
Accelerator Pedal Position When Engine Overspeed Detected	%	This parameter displays the accelerator pedal position (APP) observed upon initial detection of an overspeed condition. This value will be updated upon each overspeed condition.
Active Grille Air Shutter Ambient Air Temperature	ºC (ºF)	This parameter displays the temperature detected and used by the Active Air Shutter system.
Active Grille Air Shutter Control	Active / Inactive	This parameter indicates if the Active Grille Air Shutter Control is Active or Inactive.
Active Grille Air Shutter Control Status	ON/OFF	This parameter displays the control status of the active air shutter.
Active Grille Air Shutter Desired Position Achieved	Yes / No	This parameter indicates if the Active Grille Air Shutter Desired Position is Achieved.
Active Grille Air Shutter Diagnostic Control	Active / Inactive	This parameter indicates if the control system is attempting to move the Active Grille Air Shutter for diagnostic purposes. Displays Active or Inactive.
Active Grille Air Shutter Ice Protection Mode	Active / Inactive	This parameter indicates whether or not the Shutter control algorithm is in Ice Mode, which attempts to park the shutter and prohibit further operation. Displays Active or Inactive.
Active Grille Air Shutter Initialization Status	Complete / Incomplete	This parameter displays the initialization status of the Active Grille Air Shutter.
Active Grille Air Shutter Position	%	This parameter displays the position of the active grill air shutter. 0% = fully closed, 100% = fully open.
Active Grille Air Shutter Status	Moving / Stationary	This parameter indicates if the Active Grille Air Shutter is Moving or Stationary.

Parameter	Value	Description
Active Grille Air Shutter Supply Voltage	Volts	This parameter indicates the Active Grille Air Shutter Supply Voltage.
Active Grille Air Shutter Torque Command	Counts	This parameter displays the commanded torque level for the active air shutter. 0 = Nominal Torque.
Air/Fuel Equivalence Ratio Command	Varies	This parameter should display 1.0 when in Closed Loop fuel control.
Alternative Fuel Injector 1, 2, 3, 4, 5, 6, 7 or 8 Command	On / Off	This parameter contains the commanded state of the alternative fuel injector 1 output (the output is considered to be commanded on if the injector is enabled while the engine is running or cranking).
Alternative Fuel Injector 1 Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is shorted to voltage.
Alternative Fuel Injector 1 Control Circuit Low Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is shorted to ground.
Alternative Fuel Injector Pulse Width Bank 1	ms	This parameter displays the alternative fuel injector pulse width (on time) commanded to each cylinder on bank 1.
Alternative Fuel Injector Pulse Width Bank 2	ms	This parameter displays the alternative fuel injector pulse width (on time) commanded to each cylinder on bank 2.
Alternative Fuel Rail Pressure	kPa / psi	This parameter displays the fuel rail pressure calculated as the difference between alternative fuel rail absolute pressure and ambient air pressure (barometric pressure). This measurement is a "gauge pressure." (Gauge = Absolute − Ambient) Range 0 to 2048 kPa.
Alternative Fuel Rail Pressure	Volts	This parameter displays the alternative fuel rail pressure sensor analog input as a percentage of its reference voltage.
Alternative Fuel Rail Pressure Sensor	kPa	This parameter displays an ‘undefaulted’ fuel rail pressure relative to manifold vacuum. This is intended for gaseous fuel injection alternative fuel applications (CNG/LPG Mono-Fuel and Bi-Fuel).
Alternative Fuel Rail Temperature	°C (°F)	This parameter displays the undefaulted alternative fuel rail temperature measured by a sensor. Range is −40 to 215°C.
Alternative Fuel Shutoff Valve 1 or 2 Control Circuit Command	On / Off	This parameter displays the commanded state of the alternative fuel shutoff valve 1 output (the output is considered to be commanded on if the shutoff valve is enabled while the engine is running or cranking).
Alternative Fuel Shutoff Valve 1 or 2 Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Alternative Fuel Shutoff Valve 1 or 2 control circuit. The parameter displays Malfunction if the Alternative Fuel Shutoff Valve is shorted to voltage.
Alternative Fuel Tank Pressure	Volts	This parameter displays the alternative fuel tank pressure sensor analog input as a percentage of its reference voltage.
Ambient Air Temperature	Varies	This parameter displays temperature from the input of the Intake Air Temperature Sensor.
Ambient Air Temperature	°C (°F) Varies	This parameter displays the outside air temperature as calculated by the control module.
Ambient Air Temperature When Recommended Maximum Fuel Alcohol Content Exceeded	°C (°F)	This parameter displays the ambient air temperature when the recommended maximum fuel alcohol content was exceeded.
Ambient Humidity	%	This parameter displays the current ambient humidity level.
APP Sensor 1	Volts	This parameter displays the actual voltage on the accelerator pedal position (APP) sensor 1 signal circuit as measured by the control module.

Parameter	Value	Description
APP Sensor 1 and 2	Agree	This parameter displays Disagree if the control module detects the signal voltage from APP sensor 1 is not in correct relationship to APP sensor 2. The scan tool displays Agree under the normal operating conditions.
APP Sensor 1 Circuit Status	OK / Okay	APP Sensor 1 Out of Range indicates that the sensed accelerator pedal position 1 sensor value is currently out of range or that a Malfunction has been detected based upon the sensed accelerator pedal position 1 sensor value being out of range
APP Sensor 1 Learned Applied Position	%	This parameter contains the learned maximum (fully applied) accelerator pedal position relating to absolute accelerator pedal position (no correction or normalization based upon learned minimum or maximum positions) from accelerator pedal position sensor 1.
APP Sensor 1 Learned Released Position	Volts	This parameter indicates the accelerator pedal sensor 1 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the calibration.
APP Sensor 1 Position	%	This parameter contains the displacement determined from accelerator pedal position sensor 1 (corrected and normalized based upon its learned minimum and maximum positions).
APP Sensor 2	Volts	This parameter contains the accelerator pedal position sensor 2 analog input as a percentage of its reference voltage
APP Sensor 2	Volts	This parameter displays the actual voltage on the accelerator pedal position (APP) sensor 2 signal circuit as measured by the control module.
APP Sensor 2 Circuit Status	OK / Okay	APP Sensor 2 Out of Range indicates that the sensed accelerator pedal position 2 sensor value is currently out of range or that a malfunction has been detected (and latched) based upon the sensed accelerator pedal position 2 sensor value being out of range
APP Sensor 2 Learned Applied Position	%	This parameter contains the learned maximum (fully applied) accelerator pedal position relating to absolute accelerator pedal position (no correction or normalization based upon learned minimum or maximum positions) from accelerator pedal position sensor 2.
APP Sensor 2 Learned Released Position	Volts	This parameter indicates the accelerator pedal sensor 2 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the engine control module.
APP Sensor 2 Position	%	This parameter contains the displacement determined from accelerator pedal position sensor 2 (corrected and normalized based upon its learned minimum and maximum positions).
APP Sensors	%	This parameter contains the accelerator pedal position resulting directly from the settling of differences of the accelerator pedal position sensors (prior to any compensation to determine driver intent).
Autostop/Autostart Disable Mode	Active	This parameter displays “Active” when all conditions for allowing the autostop/autostart mode are present (no inhibit conditions exist), this parameter displays "Inactive" when all conditions for allowing the autostop/autostart mode are not present.
Autostart Inhibit Reason Autostop/Autostart Malfunction	No	This parameter displays that a immediate stop was commanded due to a Autostop/Autostart malfunction.

Parameter	Value	Description
Autostart Inhibit Reason	No	The scan tool displays Yes if one of the following Autostart Inhibit Reason is detected. Control Function Active, Crank Abort, Driver Exited Vehicle, ECM Malfunction, ECM Request, Engine Coolant Temperature Out of Range, Hood Ajar, Hybrid/EV Power Conditions, Hybrid/EV Battery Pack Contactor Open, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Not Commanded, Run/Crank Not Active, System Malfunction, Transmission Range.
Autostart Reason	No	This parameter displays Yes if one of the following Autostart Reason is detected. A/C Request, Acceleration Request, Accelerator Pedal Pressed, Auxiliary Transmission Fluid Pump Not Available, Brake Booster Weak Vacuum, Brake Pedal Released, Clutch Pedal Applied, Control Function Active, Drive Motor Inverter Temperature High, Drive Motor Temperature High, Driver Exited Vehicle, ECM Request, Engine Coolant Temperature Out of Range, Hood Ajar, Hybrid/EV Battery Module Voltage Low, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Temperature, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Ignition Switch Start, Inclination, Invalid Data Received, Low Voltage Battery Discharge Current High, Low Voltage Battery State of Function Low, Low Voltage Battery State of Health Low, Low Voltage Battery Voltage Low, Maximum Autostop Time Exceeded, Minimum Engine Run Time Not met, Reduced Engine Power Active, Remote Vehicle Start Request, Stop/Start Select Switch, System Malfunction, System Optimization, System Voltage Low, TCM Demand, Tow/Haul Mode Switch ON, Transmission Fluid Temperature Out of Range, Transmission In Reverse, Transmission Range, Vehicle Speed Too High.
Autostop Disable Reason	No	The scan tool displays Yes if one of the following Autostop Disable Reason is detected. 12 V Start Counter Exceeded, A/C Request, Acceleration Request, Accelerator Pedal Pressed, Auxiliary Transmission Fluid Pump Not Available, Brake Booster Weak Vacuum, Brake Pedal Released, Clutch Pedal Applied, Control Function Active, Drive Motor Inverter Temperature High, Drive Motor Temperature High, ECM Request, Engine Coolant Temperature Out of range, Engine Speed High, Generator Load High, Hood Ajar Hybrid/EV Battery Module Voltage Low, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Temperature, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Idle Boost Mode Active, Ignition Switch Start, Intake Manifold Weak Vacuum, Invalid Data Received, Low Voltage Battery Discharge Current High, Low Voltage Battery State of Charge Low, Low Voltage Battery State of Function Low, Low Voltage Battery State of Health Low, Low Voltage Battery Temperature Out of Range, Low Voltage Battery Voltage Low, Maximum Vehicle Stop Time Exceeded, Minimum Engine Run Time Not Met, Reduced Engine Power Active, Remote Vehicle Start Request, Run/Crank Not Active, Stop/Start Select Switch, System Optimization, System Voltage Low, TCM Request, Tow/Haul Mode Switch ON, Transmission Fluid Temperature Out of Range, Transmission in Reverse, Transmission Range, Vehicle Inclination, Vehicle Speed Threshold Not Reached, Vehicle Speed Too High, Wheel Slip Detected.
Auxiliary Coolant Pump Relay Command	On / Off	This parameter displays the command status of the Auxiliary Coolant Pump Relay.
Auxiliary Coolant Pump Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit High Voltage Test. Can display OK / Okay, Malfunction, or Not Run.
Auxiliary Coolant Pump Relay Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit Low Voltage Test. Can display OK / Okay , Malfunction, or Not Run.

Parameter	Value	Description
Auxiliary Coolant Pump Relay Control Circuit Open Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the Auxiliary Coolant Pump Relay Control Circuit Open Circuit Test. Can display OK / Okay , Malfunction, or Not Run.
Average Fuel Age	Days	This parameter displays the average fuel age in days.
Axle Torque	N•m	This parameter displays the Axle Torque value sent from the hybrid control processor (HCP) to the ECM and anti-lock brake system (ABS) module.
Axle Torque Command	N•m (lb ft)	This parameter displays the commanded Axle Torque value.
BARO	kPa (psi)	This parameter displays the barometric pressure. The control module uses the barometric pressure sensor input for fuel control to compensate for altitude differences.
BARO Sensor	Volts	This parameter displays the barometric pressure sensor voltage.
Barometric Pressure Sensor Bank 1	kPa (psi)	This parameter displays the ambient air pressure.
Barometric Pressure Sensor Bank 2	Volts	This parameter displays the signal voltage of the barometric pressure sensor
Base Model Part Number	#	This parameter displays information which is used during programming to identify unique combinations of hardware and software.
Battery Capacity	Ah	This parameter displays the capacity of the battery in Amp-hours.
Battery Sensor Module Battery State Information	Available / Not Available	This parameter indicates if Battery State Information is Available or Not Available. Battery State Information is Not Available when there is a battery drain such as a parasitic draw.
Battery Sensor Module Reset Occurred - Using Estimated State of Charge	Yes / No	This parameter indicates if the current battery State of Charge is estimated. This occurs when the BSM has been reset.
Battery State of Charge	%	This parameter displays the Battery State of Charge (SOC). SOC is a calculated value provided by an intelligent battery sensor (IBS).
Battery State of Health	%	This parameter displays the Battery State of Health (SOH). SOH is a calculated value provided by an intelligent battery sensor (IBS).
Battery Type	N/A	This parameter displays the battery type.
Battery Voltage	Volts	This parameter displays the battery voltage.
Battery Voltage High Resolution	Volts	This parameter displays the high resolution battery voltage value.
Boost Pressure	kPa	This parameter shows the Turbocharger boost pressure in kPa.
Boost Pressure Sensor	kPa	This parameter shows the Turbocharger boost pressure in kPa.
Boost Pressure Sensor	Volts	This parameter displays the turbocharger boost pressure sensor in voltage.
Brake Booster Pressure Sensor	Volts	This parameter displays the brake booster vacuum pressure analog input as a percentage of its reference voltage.
Brake Booster Pressure Sensor	kPa	This parameter displays the undefaulted, unfiltered brake booster vacuum pressure measured by a sensor.
Brake Pedal Position Circuit Signal	Closed	This parameter displays the serial data message of the brake signal from the electronic brake and traction control module (EBTCM).
Brake Pedal Position Circuit Signal	Released	This parameter displays the displacement of the brake pedal.

Parameter	Value	Description
Brake Pedal Position Sensor	%	This parameter displays the displacement of the brake pedal, where 0% corresponds to the brake pedal being released and 100% corresponds to the brake pedal being fully applied.
Brake Pedal Position Sensor	Volts	This parameter displays the brake pedal position as indicated by the analog sensor as a percentage of its reference voltage.
Brake Pedal Position Sensor Fully Released Learn Status	Complete	This parameter displays the brake pedal fully released learn position status.
Brake Pedal Position Sensor Learned Released Position	Volts	This parameter displays the position learned for the brake pedal position sensor when the brake pedal is fully released.
Brake Pedal Position Sensor Signal	Released	This parameter displays the serial data message of the brake position sensor signal from the electronic brake and traction control module (EBTCM).
Calculated Air Flow	G/S	This parameter contains the mass airflow determined from the speed density (MAP based) calculation of air mass per cylinder.
Calculated BARO	kPa / psi	This parameter contains an estimate of barometric pressure, used to correlate with sensed ambient air pressure in the Barometric Pressure Correlation Diagnostic.
Calculated Catalyst Temperature or Calculated Catalyst Temperature Bank 1 or Bank 2	°C (°F)	This parameter contains the estimated catalyst temperature (as a function of engine speed, engine airflow, and fuel ethanol percentage) for use in the oxygen sensor and catalyst monitor diagnostic algorithms.
Calculated Engine Oil Pressure	kPa (psi)	This parameter displays the filtered value for the engine oil pressure.
Calculated Engine Oil Temperature	°C (°F)	This parameter displays the estimated engine oil temperature (as a function of engine coolant temperature and other parameters).
Calibration History Buffer	Unlocked	This parameter displays locked when the buffer has been locked against further updates due to detection of a non-production calibration.
Calibration Verification Number History 1–10	#	This parameter displays the history entries for the primary calibration part in the controller.
Camshaft Position Active Counter	Counts	This parameter displays a rolling count of the number of primary cam position sensor pulses.
Camshaft Position Sensor	RPM	This parameter displays the speed of the engine as calculated by the signal from a camshaft position (CMP) sensor. This parameter will always display 0 unless a condition with the CKP sensor or CKP reluctor exists. If a CKP condition exists the control module will use a valid CMP sensor signal to determine engine speed and crank/ camshaft position.
Camshaft Position Signal Output Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to voltage.
Camshaft Position Signal Output Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to ground.
Camshaft Position Signal Output Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is open.
Catalyst Monitor Complete	Yes/No	This parameter indicates the status of the Catalyst. The scan tool displays YES when the diagnostic is complete. And NO if the diagnostic has not run, or a malfunction is detected in the catalyst.

Parameter	Value	Description
Catalyst Monitor Complete This Ignition Cycle	Yes/No	This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test.
Catalyst Monitor Enabled	Yes/No	The scan tool displays YES when the Catalyst Monitor is Enabled. If the scan tool displays NO this could indicate a malfunction in the Catalyst Monitor circuit.
Catalyst Monitor Enabled this Ignition Cycle	Yes/No	This parameter displays the monitor enable status during the current driving/monitoring cycle.
Catalyst Monitor Not At Idle Test Conditions Met	Yes/No	This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test.
Catalyst Monitor Test Counter or Catalyst Monitor Test Counter Bank 1 or 2	Counts	This parameter contains the number of repeated results of the catalyst monitor diagnostic test that have been performed since a code clear (used to determine if a sufficient number of tests have run to report a passing condition).
Catalyst Monitor Test Result or Catalyst Monitor Test Result Bank 1 or 2	No Decision/Failed/Passed	This parameter indicates the status of the catalyst monitor diagnostic. Multiple tests may run before the diagnostic reports a “Pass” or “Fail” and will be tracked by Catalyst Monitor Diagnostic Test Counter. When this Parameter reports a “Pass” or “Fail”, the diagnostic is complete for the current trip and will not attempt any further tests.
Catalyst Monitor Test State	Active/Inactive	This parameter indicates the status of the catalyst monitor diagnostic by displaying active or inactive. This test will only run with the engine at idle.
Change Engine Oil Indicator Command	Off	This parameter sends a signal through the serial communication to inform the driver to change the engine oil. It is based on a calibrated amount of time.
Charge Air Cooler Coolant Pump Relay Command	Off	This parameter displays the commanded state of the intercooler pump relay command.
Charge Air Cooler Coolant Pump Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is shorted to voltage.
Charge Air Cooler Coolant Pump Relay Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is shorted to ground.
Charge Air Cooler Coolant Pump Relay Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is open.
Clutch Pedal Starter Inhibit Switch (If Equipped)	On	This parameter displays ON when the clutch pedal is released.
Clutch Pedal Switch (If Equipped)	Released	This parameter displays the state of the clutch pedal as determined by the control module from the clutch pedal switch.
Cold Startup	No	This parameter displays whether the engine meets the conditions for a cold startup during the present ignition cycle. The scan tool displays Yes when the conditions for a cold startup are met during the ignition cycle. The scan tool displays No when the conditions for a cold startup are not met during the present ignition cycle. Conditions for a cold startup require the coolant temperature and the intake air temperature to be below a predetermined temperature and within a certain range of each other. These conditions must occur after the engine was warmed up to a specific temperature during the previous ignition cycle.

Parameter	Value	Description
Component Monitor Complete	Yes/No	This parameter displays Yes when the Component Monitor is Complete. The engine control module looks at many input and output components to make this determination. If a malfunction is detected the scan tool will display No.
Component Monitor Enabled	Yes/No	This parameter displays Yes when Component Monitor is Enabled. And No when it is not Enabled.
Component Monitor - This Ignition Cycle	Disabled, Enabled, Complete	This parameter displays the status of the Component Monitor during this ignition cycle. Can display Disabled, Enabled, or Complete.
Cooling Fan Command	%	This parameter displays the amount of fan power commanded as a percentage of the total fan power available.
Cooling Fan Motor Command	%	This parameter displays the commanded duty cycle for the cooling fan.
Cooling Fan Control Circuit High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the Cooling Fan Control Circuit High Voltage Test. Can display OK / Okay , Malfunction, or Not Run.
Cooling Fan Control Circuit Low Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the Cooling Fan Control Circuit Low Voltage Test. Can display OK / Okay , Malfunction, or Not Run.
Cooling Fan Control Circuit Open Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the Cooling Fan Control Circuit Open Circuit Test. Can display OK / Okay , Malfunction, or Not Run.
Cooling Fan Relay 1 Command	On	This parameter displays the commanded state of the fan relay 1 control circuit. The cooling fan relay 1 should be ON when the scan tool indicates the FC Relay 1 Command is ON. The cooling fan relay 1 should be OFF when the scan tool indicates the FC Relay 1` Command is OFF.
Cooling Fan Relays 2 and 3 Command	On	This parameter displays the commanded state of the fan relay 2 output.
Cooling Fan Relay 1 Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is open.
Cooling Fan Relay 1, or 2 and 3 Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is shorted to voltage.
Cooling Fan Relay 1, or 2 and 3 Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is shorted to ground.
Cooling Fan Solenoid Valve Command	%	This parameter displays the commanded duty cycle for the PWM fan system.
Cooling Fan Speed	Varies	This parameter displays the current state of the cooling fan speed. (For example OFF, Low, Medium, or High) rather than rotational speed.
CPP Learn Status	Learned	This parameter displays the status of the procedure used to learn the clutch pedal fully applied position.
CPP Learned Apply Position	Volts	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is fully applied during the associated learn procedure.
CPP Learned Release Position	Volts	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is released.
CPP Sensor	Volts	This parameter displays the clutch pedal position sensor analog input as a voltage.
CPP Sensor	%	This parameter displays the displacement of the clutch pedal (corrected and normalized based upon its learned released and fully applied positions), where 0% corresponds to the clutch pedal being released and 100% corresponds to the clutch pedal being fully applied.

Parameter	Value	Description
Crank Request Signal	No / Yes	This parameter displays whether the ignition switch has been cycled to the crank position requesting the control module to activate the starter relay.
Crankshaft Position Active Counter	Counts	This parameter displays an incrementing counter when the control module receives a signal from the crankshaft position sensor (CKP).
Crankshaft Position Learned Apply Position	Volts	This parameter displays the position learned for the clutch pedal position (CPP) sensor when the clutch pedal is fully applied during the associated learn procedure.
Crankshaft Position Learned Release Position	Volts	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is released.
Crankshaft Position Resync Counter	Counts	This parameter displays the number of times the control module has to resynchronize with the CKP sensor. The parameter will begin to increment if the control module does not detect a CKP reference pulse. The parameter will reset to 0 after the ignition is switched OFF.
Crankshaft Position Sensor	RPM	This parameter displays engine speed.
Crankshaft Position Signal Output Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is shorted to voltage.
Crankshaft Position Signal Output Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is shorted to ground.
Crankshaft Position Signal Output Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is open.
Crankshaft Position Variation Learn	Not Learned	This parameter displays if the crank angle learned this key cycle.
Crankshaft Position Variation Learn Attempts	Counts	This parameter displays the number of attempts to learn the crank angle sensing error (CASE) during current key cycle.
Crankshaft Position Variation Learn Crank Pulse to Cylinder Count	Counts	This parameter displays the number of attempts to learn the crank angle sensing error (CASE) during the current key cycle.
Crankshaft Position Variation Learn Crank Pulse to Cylinder Count	Agree	This parameters displays the number of crank pulses observed over an engine cycle did not equal the number of cylinders for the engine at some point during the CASE learn cycle.
Crankshaft Position Variation Learn Cylinder Compensation Factors	In Range / Out Of Range	This parameter indicates if one or more compensation factors calculated for individual cylinders is out of range.
Crankshaft Position Variation Learn Data Collected	Sufficient / Insufficient	This parameter indicates if the CASE learn algorighm has collected sufficient data.
Crankshaft Position Variation Learn Opposing Cylinder Compensation Factors	In Range / Out Of Range	This parameter indicates if the difference in the compensation factors calculated for one or more pairs of opposing cylinders is out of range.
Crankshaft Position Variation Learn Reluctor Ring Tooth Spacing Factors	In Range / Out Of Range	This parameter indicates if one or more of the compensation factors calculated for the individual tooth spacing is out of range.
Crankshaft Position Variation Learn Required Engine Speed	In Range	This parameter displays that the engine speed required to complete the CASE learn process has not been achieved.
Crankshaft Position Variation Learn Status	Complete	This parameter displays the status of the crank angle sensing error (CASE) learn algorithm.
Crankshaft Position Variation Learn Sum of Cylinder Compensation Factors	In Range / Out Of Range	This parameter indicates if the sum of the compensation factors calculated for the individual cylinders is too large.

Parameter	Value	Description
Cruise Control	Active	This parameter displays the status of the cruise control system as determined by the control module.
Cruise Control Acceleration Switch	Active, Inactive, Invalid	This parameter Indicates the state of the cruise control speed ACCEL switch. This signal is based upon the state of the cruise control speed ACCEL switch received over serial communication from the platform electronics.
Cruise Control Cancel Switch	Inactive	This parameter displays the status of the cruise control cancel switch.
Cruise Control Switch 2	N/A	This parameter indicates the state of the secondary Cruise Control Switch.
Cruise Control Disengage 1-8 History	Reason for Cruise Disengagement	The parameter displays the last 8 cruise control disengages in order from 1 to 8, with 8 being the most recent. There are approximately 30 possible causes for the cruise control to disengage.
Cruise Control Inhibit Reason	Off	The parameter displays the reason the cruise control system cannot engage.
	Park/Neutral	
Cruise Control ON/OFF Switch	On	The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as ON.
Cruise Control Resume/ Accelerator Switch	On	The scan tool displays ON, when the cruise ON/OFF switch is ON and the resume/accel (+) button is pressed, the ECM detects a predetermined voltage value for the resume/ accel. switch.
Cruise Control Set/Coast Switch	On	The scan tool displays ON, when the cruise ON/OFF switch is ON and the ECM detects a predetermined voltage value for the set/coast (−) switch.
Cruise Control Switch	Inactive	The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as Active.
Current Fuel Type	Varies	This parameter displays the current fuel type such as Not available, Gasoline/petrol, Methanol, Ethanol, Diesel, Liquefied Petroleum Gas, Compressed Natural Gas, Propane, Battery/electric, Bi-fuel, or Hybrid.
Current Gear	P/N	This parameter displays the transmission gear commanded by the transmission control module.
	Reverse/1st-5th	
Current Gear When Engine Overspeed Detected	Varies	This parameter displays the transmission actual gear observed upon initial detection of an overspeed condition.
Cycles of Misfire Data	counts	This parameter displays the number of cylinder firing events recorded by the control module.
Cylinder Deactivation Disable History 1-8	—	This parameter displays one of the last eight reasons for the reactivation of all engine cylinders.

Parameter	Value	Description
Cylinder Deactivation Inhibit	Yes / No	A/C Compressor Clutch On, Acceleration Request, APP High, APP Rate High, Axle Torque Limiting, Brake Booster Pressure Sensor DTC, Brake Booster Weak Vacuum, Calculated Torque, Camshaft Position Actuator DTC, Camshaft Position Sensor DTC, Catalyst Overtemperature Protection, Catalyst Temperature Low, Crankshaft Position Sensor DTC, Cylinder Deactivation Solenoid Valve DTC, Cylinder Deactivation System DTC, Deceleration Fuel Cut-Off, ECT, ECT Sensor DTC, Engine Controls Ignition Relay DTC, Engine Oil Pressure, Engine Oil Pressure Control Solenoid Valve Stuck Off, Engine Oil Pressure Control Test Active, Engine Oil Pressure Sensor DTC, Engine Oil Temperature, Engine Overtemperature Protection, Engine Speed, Engine Stall Prevention, Exiting Deceleration Fuel Cut-Off, Fuel Trim Cylinder Balance DTC, Heater Performance, HO2S 2 Test, Hot Coolant Mode, IAT Sensor DTC, Ignition Voltage, Injector Stable Time, Insufficient Torque Capacity, Intake Manifold Weak Vacuum, MAP Sensor DTC, Maximum Deactivation Time Exceeded, Maximum Throttle Exceeded, Minimum Time After TAC DTC, Minimum Time On All Cylinders, Misfire DTC, Oil Aeration, Panic Brake Assist Active, Piston Protection, RPM Limit, Scan Tool Override, TAC System DTC, Torque Reduction, Transmission Gear, Transmission Range, Transmission Shifting, Vehicle Speed Too Low, VSS DTC
Cylinder Deactivation Performance Test	OK / Okay, Malfunction	This parameter indicates if one or more cylinders failed to deactivate when commanded.
Cylinder Deactivation System Command	All Cylinder / Cylinder Deactivation	This parameter indicates the status of the Cylinder Deactivation System Command.
Cylinder 1,2,3,4,5,6,7,8 Current Misfire Counter	Counts	The scan tool displays a range of 0–255 counts. This parameter displays the number of misfires that have been detected during the last 255 cylinder firing events. The counters may normally display some activity, but the activity should be nearly equal for all of the cylinders, and in low numbers.
Cylinder 1–4 Exhaust Camshaft Profile Sleeve Position	Fixed Lift / Low Lift / High Lift / Cylinder Deactivation / Undetermined	The scan tool displays the position of the Exhaust Camshaft Profile Sleeve as commanded by the control module.
Cylinder 1,2,3,4,5,6,7, or 8 History Misfire Counter	Counts	The scan tool displays a range of 0–65,535 counts. The misfire history counters display the total level of misfire that has been detected on each cylinder. The misfire history counters will not update or show any activity until a misfire DTC P0300 has become active. The misfire history counters will update every 255 cylinder firing events.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to voltage.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to ground.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is open.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Flow Identifier	OK / Okay	This parameter displays the End of Line Injector Adjustment (EIA) for the fuel injector. This value shall be used by the ECM for adjustment to actual fuel injected quantity compared to nominal for the injector.
Cylinder 1-6 Injector Control Circuit Status	OK / Okay	This parameter displays the state of the fuel injector control circuit.
Cylinder 1-6 Injector Disabled Misfire Detected	No	This parameter displays the injector that has been disabled by the misfire catalyst converter protection calibration.
Cylinder 1–4 Intake Camshaft Profile Sleeve Position	Fixed Lift / Low Lift / High Lift / Cylinder Deactivation / Undetermined	The scan tool displays the position of the IntakeCamshaft Profile Sleeve as commanded by the control module.

Parameter	Value	Description
Cylinder 1–6 Knock Detected	No	This parameter displays yes if a knock has been detected in an individual cylinder.
DC/DC Converter Ignition 1 Signal	On / Off	This parameter indicates if the DC/DC Converter Ignition 1 Signal is On or Off.
DC/DC Converter Output Voltage 1 Variance - Engine Cranking	Volts	This parameter indicates the DC/DC Converter Output Voltage 1 Variance with the engine cranking.
DC/DC Converter Output Voltage 1 Variance - Engine Running / Off	Volts	This parameter indicates the DC/DC Converter Output Voltage 1 Variance with the engine running or Off.
DC/DC Converter Output Voltage 2 Variance - Engine Cranking	Volts	This parameter indicates the DC/DC Converter Output Voltage 2 Variance with the engine cranking.
DC/DC Converter Output Voltage 2 Variance - Engine Running / Off	Volts	This parameter indicates the DC/DC Converter Output Voltage 2 Variance with the engine running or Off.
DC/DC Converter Output Voltage Sensor Circuit 1	Volts	This parameter measures voltage at the DC/DC Converter Output Voltage Sensor Circuit 1.
DC/DC Converter Output Voltage Sensor Circuit 2	Volts	This parameter measures voltage at the DC/DC Converter Output Voltage Sensor Circuit 2.
Deceleration Fuel Cut-Off	Inactive	This parameter displays the status of the operating mode of the control module used to turn OFF the fuel injectors and the EVAP canister purge valve during certain deceleration conditions.
Desired Active Grille Air Shutter Position	%	This parameter displays the commanded position for the active grille air shutter. 0%=fully closed, 100%=fully open.
Desired Boost Pressure	kPa	This parameter displays the desired turbocharger boost pressure.
Desired Cooling Fan Speed	RPM	This parameter displays the desired fan speed.
Desired ECT	°C (°F)	This parameter displays the desired engine coolant temperature in degrees.
Desired Exhaust Camshaft Position or Desired Exhaust Camshaft Position Bank 1 or 2	Degrees	This parameter displays the desired exhaust camshaft angle as commanded by the control module.
Desired Fuel Pressure	kPa (psi)	This parameter displays the desired fuel supply pressure.
Desired Fuel Rail Pressure	MPa (psi)	This parameter displays the desired Fuel Rail Pressure commanded by the control module.
Desired Idle Speed	RPM	This parameter displays the desired engine idle speed as commanded by the control module. The desired idle speed varies depending on engine load.
Desired Intake Camshaft Position or Desired Intake Camshaft Position Bank 1 or 2	Degrees	This parameter displays the desired intake camshaft angle as commanded by the control module.
Desired Throttle Position	%	Commanded Throttle Actuator Control.
Distance Since DTC Cleared	km / mi	This parameter displays in kilometers or miles the distance traveled since a DTC was cleared.
Distance Since First Malfunction	km / mi	This parameter displays in kilometers or miles the distance traveled since a Malfunction occurred.
Distance Since Last Malfunction	km / mi	This parameter displays the distance accumulated since last malfunction was captured. This parameter is only meaningful within the context of a failure record or freeze frame.

Parameter	Value	Description
Distance Since Last Oil Level Warning	km / mi	This parameter displays in kilometers or miles the distance traveled since the last oil level warning Malfunction occurred.
Distance Since Last Oil Pressure Warning	km / mi	This parameter displays in kilometers or miles the distance traveled since the last oil pressure warning Malfunction occurred.
Distance Since Recommended Maximum Fuel Alcohol Content Exceeded	km / mi	This parameter displays in kilometers or miles the distance Since Recommended Maximum Fuel Alcohol Content Exceeded.
Distance This Driving Cycle	km / mi	This parameter displays the distance a vehicle has traveled in the current driving cycle.
Distance with MIL On	km / mi	This parameter displays the accumulated distance driven with the malfunction indicator lamp (MIL) on.
Drag Control Status	Active/Inactive	EDC Active (Drag Active) control mode is indicated when the requested torque signal is above the driver requested value while the traction control system signal input is active.
Driver Requested Axle Torque	N•m	This parameter displays a (desired) output value after comparing engine load as an input to the hybrid control processor and engine control module.
Drop-Throttle Detected while Traction Control Active	No	This parameter displays if the Drop Throttle Control Mode is active while the Traction Control System Data Control Signal input is active.
Drop-Throttle Status	Inactive	This parameter displays the Drop Throttle Control Mode is active when the Requested Torque Signal indicates greater than 90 percent duty cycle while the Traction Control System Data Control Signal input is active.
ECM Authentication Status	Valid	ECM Authentication Status indicates the result of the comparison between the last received immobilizer response and the expected response calculated into the ECM.
ECM Challenge Status	Valid	This parameter displays the immobilizer system status of the ECM challenge. This indicates whether the currently calculated ECM challenge is valid.
ECM in Immobilizer Fail Enable Mode	Yes / No	This parameter displays that a serial communication failure has been detected after the receipt of the correct VTD password.
ECM Odometer	km / mi	This parameter displays the odometer reading of the vehicle.
ECM Response Source	Ignition Switch Start	ECM Response Source indicates the source used to calculate the ECM response.
Economy Mode Indicator Command	Off	This parameter indicates the status of the serial data signal used to illuminate the economy mode indicator lamp.
ECT Sensor	°C (°F)	This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperature (ECT) sensor.
ECT vs. IAT Sensor Temperature at Last ECT vs. RCT Malfunction Detection	Agree	This parameter displays that the temperature values of the ECT and IAT sensors did not agree at the time of the most recent failure of the ECT/RCT rationality diagnostic.
EGR/Camshaft Position Monitor Complete	Yes/No	This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/Camshaft Position Monitor is complete.
EGR/Camshaft Position Monitor Complete This Ignition Cycle	Yes/No	This parameter displays Yes or No of the completion status during the current driving/monitoring cycle of emission related monitors.
EGR/Camshaft Position Monitor Enabled	Yes/No	This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/Camshaft Position Monitor is Enabled.

Parameter	Value	Description
EGR/Camshaft Position Monitor Enabled This Ignition Cycle	Yes/No	This parameter displays Yes or No of the completion status during the current driving/monitoring cycle of emission related monitors.
Electric Power Management Inhibit Reason	None	This parameter displays the reason for the source of the Regulated Voltage Control (RVC) override command. RVC lowers system operating voltage to reduce system electrical load and improve fuel economy performance. The following is a list of possible reasons: • None • Control Function • Active/Fuel System • On-board Diagnostic System • Air Flow Measurement System • Cylinder Deactivation System • System Transmission Control Module
End Model Part Number	#	This parameter identifies the part number that represents the combination of hardware, software, and calibrations present in the ECU.
Engine Autostopped	No	This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostart/stop functionality.
Engine Calibration Part Number History 1-10	#	This parameter displays the engine calibration part number history.
Engine Calibration Part Number History 1-10 Counter	#	This parameter displays the number of times the engine controller had been calibrated.
Engine Controls Ignition Relay Command	Off	This parameter displays the state of the control circuit for control module power relay as commanded by the control module.
Engine Controls Ignition Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to voltage.
Engine Controls Ignition Relay Controls Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to ground.
Engine Controls Ignition Relay Controls Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is open.
Engine Controls Ignition Relay Feedback 2 Signal	Volts	This parameter indicates the signal voltage from the second input to the controller from the powertrain relay.
Engine Controls Ignition Relay Feedback 3 Signal	Volts	This parameter indicates the signal voltage from the third input to the controller from the powertrain relay.
Engine Controls Ignition Relay Feedback Signal	Volts	This parameter displays the voltage available at the engine controls ignition relay terminal of the engine control module.
Engine Coolant Pump Clutch Relay Command	Flow / No Flow	This parameter displays the commanded state of the engine coolant pump clutch.
Engine Coolant Thermostat Heater Command	%	This parameter displays the commanded duty cycle for the engine coolant thermostat.
Engine Coolant Thermostat Heater Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is shorted to voltage.

Parameter	Value	Description
Engine Coolant Thermostat Heater Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is shorted to ground.
Engine Coolant Thermostat Heater Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is open.
Engine Crank Command	Yes / No	This parameter indicates if the engine is being commanded to crank or not.
Engine Crank Time	Seconds – Varies	This parameter indicates the time between the start of engine cranking to when the engine reaches an operating RPM.
Engine Load	%	This parameter displays the calculated engine load in percent based on inputs to the control module from various engine sensors.
Engine Load During Misfire History 1-10	%	This parameter displays the engine load during the last misfire event.
Engine Off	No	This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostop/autostart functionality.
Engine OFF Time	Seconds – Varies	This parameter displays the amount of time that has elapsed since the engine was last cycled OFF.
Engine Oil Absolute Pressure Sensor	kPa / psi	This parameter displays the undefaulted, unfiltered measured engine oil pressure read by an oil absolute pressure sensor.
Engine Oil Level Switch	OK / Okay , Low	This parameter displays the status of the engine oil level switch as determined by the control module. The control module uses this information to turn on the low engine oil lamp if the engine oil level remains approximately 1 quart low for a sufficient amount of time. The scan tool will display Low when the engine oil level is low. The scan tool will display OK / Okay when the engine oil level is correct.
Engine Oil Life Remaining	%	This parameter displays the percent of engine oil life remaining. The controller calculates the engine oil life by monitoring engine load, coolant temperature, and engine speed.
Engine Oil Pressure	kPa / psi	This parameter displays the actual engine oil pressure measured by a sensor.
Engine Oil Pressure Control Disable History 1 or 2	—	This parameter indicates one of the last two reasons that powertrain has disengaged oil control.
Engine Oil Pressure Control Solenoid Valve Command	High Pressure/Low Pressure	This parameter displays the commanded state of the variable displacement oil pump output.
Engine Oil Pressure Control Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is shorted to voltage.
Engine Oil Pressure Control Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is shorted to ground.
Engine Oil Pressure Control Solenoid Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is open.
Engine Oil Pressure Control Test Counter	Counts	This parameter displays the number of times that the Engine Oil Pressure Control test has been activated during the current key cycle.

Parameter	Value	Description
Engine Oil Pressure Control Test Inhibit History 1 or 2	—	This parameter indicates one of the last two reasons that powertrain has inhibited oil pressure intrusive diagnostic test.
Engine Oil Pressure Sensor	OK / Okay	This parameter displays the engine oil pressure as determined by engine oil pressure sensor.
Engine Oil Pressure Switch	OK / Okay, Low	This parameter displays the status of the engine oil pressure sensor.
Engine Oil Temperature Sensor	C° (°F)	This parameter displays engine oil temperature as measured by a sensor connected to the ECM.
Engine Oil Temperature When Engine Overspeed Detected	Temperature	This parameter displays the temperature of the engine oil as determined by the control module.
Engine Oil Type	Conventional / Synthetic	This parameter indicates whether the engine oil type is conventional or synthetic oil.
Engine Overspeed	Not Present	This parameter displays if an Engine Overspeed is Present or Not Present.
Engine Overspeed Counter	Counts	This parameter displays the accumulated number of engine overspeed detection events.
Engine Run Time	0:00:00 Increments when the engine is operating	This parameter displays the time elapsed since the engine was started.
Engine Running	No	This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostop/autostart functionality.
Engine Serial Number	#	This parameter displays the engine serial number.
Engine Shutdown Counter – Excessive Idle Time	Counts	This parameter displays the count of engine shutdowns due to excessive idle time.
Engine Shutdown Counter – High Coolant Temperature	Counts	This parameter displays the count of engine shutdowns due to high coolant temperature.
Engine Shutdown Counter – Low Coolant Level	Counts	This parameter displays the count of engine shutdowns due to low coolant level.
Engine Shutdown Counter – Low Oil Level	Counts	This parameter displays the count of engine shutdowns due to low oil level.
Engine Speed	RPM	This parameter displays the speed of the engine crankshaft rotation from information received from the crankshaft position (CKP) sensor. If there is a CKP sensor DTC, the ECM calculates the engine speed from one of the camshaft position (CMP) sensors.
Engine Speed During Misfire History 1–5	RPM	This parameter displays the last 5 engine speeds during misfire events.
Engine Speed When Engine Overspeed Detected	RPM	This parameter displays the engine speed observed upon initial detection of an overspeed condition. This value will be updated after each overspeed condition.
Engine Stalled	No	This parameter displays that the internal combustion engine has stopped running unintentionally.
Engine Starting	No	This parameter displays that the internal combustion engine is being started (in transition from engine OFF to engine running).
Engine Stopping	No	Engine Stopping indicates that the internal combustion engine is stopping (in transition from engine running to engine off, OR in transition from engine running to engine failed).
Engine Torque	%	This parameter indicates the current indicated torque as a percent of engine reference torque.
Engine Torque Command	N•m	This parameter displays the commanded predicted engine torque value, which is the torque request for the slow response air path (control of the throttle).

Parameter	Value	Description
EVAP Malfunction History	None	This parameter displays the result of the evaporative emission (EVAP) system as determined by the control module. The scan tool will display the following: • None • Excess Vacuum • Purge Valve Leak • Small Leak • Weak Vacuum • No Test Result
EVAP Monitor Complete	Yes/No	This parameter displays if the most recent evaporative emissions diagnostic test is complete.
EVAP Monitor Complete This Ignition Cycle	Yes/No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
EVAP Monitor Enabled	Yes/No	This parameter displays if the evaporative emissions diagnostic test is enabled.
EVAP Monitor Enabled This Ignition Cycle	Yes/No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
EVAP Purge Solenoid Valve Command	%	This parameter displays the commanded duty cycle for the canister purge output.
EVAP Purge Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to voltage.
EVAP Purge Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to ground.
EVAP Purge Solenoid Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is open.
EVAP System Fuel Tank Pressure Sensor to Fuel Tank Restriction Detected	Yes / No	This parameter indicates if the Fuel Tank Pressure Sensor detects a blockage in the fuel system.
EVAP Vent Solenoid Command	Not Venting	This parameter displays the state of the control circuit for evaporative emission (EVAP) vent solenoid as commanded by the control module.
EVAP Vent Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is open. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
Exhaust Camshaft Position	°	This parameter displays the position of the exhaust camshaft in terms of degrees of camshaft rotation (retard) from the park position (a value of zero represents the park position).

Parameter	Value	Description
Exhaust Camshaft Position Active Counter or Exhaust Camshaft Position Active Counter Bank 1 or 2	0–255	This parameter displays an incrementing counter when the control module receives a signal from the exhaust camshaft position (CMP) sensor.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status Bank 1 or 2	OK / Okay , Malfunction	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to voltage.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 or 2	OK / Okay , Malfunction	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to ground.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status Bank 1 or 2	OK / Okay , Malfunction	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is open.
Exhaust Camshaft Position or Exhaust Camshaft Position Bank 1 or 2	Degrees	This parameter displays the actual exhaust camshaft position in degrees.
Exhaust Camshaft Position Command or Exhaust Camshaft Position Command Bank 1 or 2	%	This parameter displays the on-time or duty cycle of the exhaust camshaft position (CMP) actuator solenoid valve as commanded by the control module.
Exhaust Camshaft Position Variance or Exhaust Camshaft Position Variance Bank 1 or 2	Degrees	This parameter displays in degrees, the difference between the desired exhaust camshaft position and the actual exhaust camshaft position.
Exhaust Camshaft Profile Actuator 1–4 Command	On / Off	This parameter displays the commanded state of the Exhaust Camshaft Profile Actuator output.
Exhaust Camshaft Profile Actuator 1–4 Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Exhaust Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Exhaust Camshaft Profile Actuator control circuit is shorted to voltage.
Exhaust Camshaft Profile Actuator 1–4 Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Exhaust Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Exhaust Camshaft Profile Actuator control circuit is shorted to ground.
Exhaust Camshaft Profile Actuator 1–4 Control Circuit Open Test Status	Okay, Malfunction, Not Run	This parameter displays the state of the Exhaust Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Exhaust Camshaft Profile Actuator control circuit is open.
Exhaust Camshaft Profile Actuator Position Sensor 1–4	%	This parameter displays the commanded duty cycle for the Exhaust Camshaft Profile Actuator.

Parameter	Value	Description
Exhaust Camshaft Profile Actuator Position Sensor 1–4	mm	This parameter displays the commanded duty cycle for the Exhaust Camshaft Profile Actuator.
Exhaust Camshaft Profile Sleeve Position Sensor 1, 2	Counts	This parameter displays the number of times that the Exhaust Camshaft Profile Sleeve test has been activated during the current key cycle.
Extended Travel Brake Pedal Position Signal	Released	This parameter displays the status of the Extended Travel Brake Pedal Position sensor.
Extended Travel Brake Pedal Switch	Released	This parameter displays the undebounced / undefaulted state of the extended travel brake switch input to the ECM
Filtered System Voltage	Volts	This parameter indicates the filtered voltage of the system.
Filtered System Voltage Prior to Engine Crank	Volts	This parameter displays the filtered system voltage just before an engine cranking event.
Freeze Frame DTC	#	This parameter displays the diagnostic trouble code (DTC) that caused the freeze frame to be stored.
Fuel Alcohol Content	%	This parameter displays the percentage of alcohol in the fuel. The value is calculated by the ECM using the fuel composition sensor input.
Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded	%	This parameter displays a percentage of Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded.
Fuel Composition Learn	Inactive	This parameter displays Active or Inactive. Active will be displayed if the ECM is learning the alcohol content of the fuel.
Fuel Composition Sensor	Hz	This parameter displays the frequency of the fuel composition sensor input. This value can be used to determine fuel composition or sensor malfunction.
Fuel Consumed Since Recommended Maximum Fuel Alcohol Content Exceeded	Liters	This parameter displays in Liters the Fuel Consumed Since Recommended Maximum Fuel Alcohol Content Exceeded.
Fuel Control Loop Status	Closed	Fuel Closed Loop Active indicates that oxygen sensor 1 of each bank is being used as feedback to adjust the amount of fuel delivered to the engine.
Fuel Economy	Liters per Hour	This parameter displays the instant fuel consumption rate of the engine in liters per hour.
Fuel Economy Mode	Inactive	This parameter indicates if the economy mode algorithm has activated economy mode.
Fuel Economy Mode Request	Off	This parameter indicates if the driver of the vehicle has requested economy mode by pressing the economy mode switch.
Fuel Economy Mode Switch	OK / Okay , Malfunction	This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is shorted to voltage.
Fuel Economy Mode Switch	OK / Okay , Malfunction	This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is shorted to ground.
Fuel Economy Mode Switch	OK / Okay , Malfunction	This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is open.
Fuel Economy Mode Switch	Volts	This parameter displays the economy mode switch reference voltage.
Fuel Enrichment-Hot Catalyst	Inactive	Fuel Enrichment Catalyst Protection Active indicates fuel is being added to cool the catalytic converter.

Parameter	Value	Description
Fuel Enrichment-Hot Coolant	Inactive	Hot Coolant Enrichment Active indicates that the conditions to enable hot coolant enrichment are active and that a richer than stoichiometric air/fuel ratio is being commanded in order to help cool the engine when a system malfunction is causing the engine to run at extreme temperatures.
Fuel Injector Driver Supply Voltage	Volts	This parameter displays the injector driver circuit boost supply voltage.
Fuel Level Sensor	Volts	This parameter displays the unfiltered fuel level sensor analog input for the primary fuel tank as a percentage of its reference voltage.
Fuel Level Sensor Left Tank (If Equipped)	Volts	This parameter displays the voltage signal received by the control module from the secondary fuel level sensor in the left side of the fuel tank.
Fuel Level Sensor Reference Command	%	This parameter displays the percentage of time that the power supply for the fuel level sensor is on. This percentage is minimized when the fuel has high ethanol content and is maximized when the fuel has low ethanol content.
Fuel Level Sensor Right Tank (If Equipped)	Volts	This parameter displays the voltage signal received by the control module from the primary fuel level sensor in the right side of the fuel tank.
Fuel Maintenance Mode	Active / Inactive	This parameter displays if the Fuel Maintenance Mode is currently active.
Fuel Maintenance Mode Counter	Counts	This parameter displays the cumulative number of fuel maintenance mode events over the life of the controller.
Fuel Mode Active	Gaseous, Gasoline	This parameter displays if the fuel mode algorithm has activated the alternative fuel mode.
Fuel Mode Driver Request	Gaseous, Gasoline	This parameter displays if the driver of the vehicle has selected one of the two specific fuel modes (alternative fuel, or petrol fuel)
Fuel Mode Indication On	Gaseous, Gasoline	This parameter displays the status of the signal used to illuminate the fuel mode indicator lamp.
Fuel Mode Indicator Lamp Command	On / Off	This parameter displays the commanded state of the fuel mode indicator lamp.
Fuel Mode Indicator Lamp Control Circuit High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the state of the Fuel Mode Indicator Lamp control circuit. The parameter displays Malfunction if the Fuel Mode Indicator Lamp control circuit is shorted to voltage.
Fuel Mode Indicator Lamp Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Fuel Mode Indicator Lamp control circuit. The parameter displays Malfunction if the Fuel Mode Indicator Lamp control circuit is shorted to ground.
Fuel Mode Indicator Lamp Control Circuit Open Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the state of the Alternative Fuel Injector 1 control circuit. The parameter displays Malfunction if the Alternative Fuel Injector 1 control circuit is open.
Fuel Mode Switch	mV	This parameter displays the Fuel Mode Switch circuit in voltage.
Fuel Mode Switch Both States Latched	True, False	This parameter displays true once both the on and off switch states are observed and will remain latched for the current ignition cycle.
Fuel Mode Switch State	Fault Low, On, Indeterminate, Off, Fault High	This parameter displays the raw fuel mode switch state information.

Parameter	Value	Description
Fuel Pressure Drop - Cylinder 1-8 Injector	—	This parameter contains the result of the Fuel Injector Flow Device Control (Direct and Gaseous Fuel Injected Engines). The fuel or alternative fuel rail pressure sensor value after the injection event is subtracted from the fuel rail or alternative fuel pressure sensor value before the injection event and reported as the pressure drop for the appropriate injector.
Fuel Pressure Regulator Control Circuit Command	On	This parameter displays the commanded state of the fuel pressure regulator 1 low side output (the output is considered to be commanded ON if the regulator is enabled while the engine is running or cranking).
Fuel Pressure Regulator Control Circuit Command	%	This parameter displays the commanded state of the fuel pressure regulator 1 low side output (the output is considered to be commanded ON if the regulator is enabled while the engine is running or cranking).
Fuel Pressure Regulator Control Circuit High Voltage Test	OK / Okay , Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pressure Regulator Control Circuit Low Voltage Test	OK / Okay , Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pressure Regulator Control Circuit Open Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Fuel Pressure Regulator High Control Circuit Command	On / Off	This parameter displays the commanded duty cycle for the fuel pressure regulator 1 solenoid output.
Fuel Pressure Regulator High Control Circuit High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pressure Regulator High Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pressure Regulator High Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Fuel Pressure Sensor	kPa / psi	For Port Fuel Injected (PFI) systems, this Parameter displays fuel rail pressure at the engine. For high pressure fuel systems, this Parameter indicates the low side fuel pressure before the high pressure pump.
Fuel Pressure Sensor	Volts	This parameter displays the fuel supply pressure sensor analog input as a percentage of its reference voltage.
Fuel Pump Enable Command	On	This parameter displays the commanded state of the fuel pump output (the output is considered to be commanded ON if its duty cycle is not zero).

Parameter	Value	Description
Fuel Pump Enable Circuit High Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pump Enable Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pump Phase U-V-W Circuits High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the Fuel Tank Zone Module’s (FTZM) reported status short to power test
Fuel Pump Phase U-V-W Circuits Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the Fuel Tank Zone Module’s (FTZM) reported status of short to ground test
Fuel Pump Phase U-V-W Circuits Open Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the Fuel Tank Zone Module’s (FTZM) reported status of open circuit test
Fuel Pump Phase U-V-W Circuits Shorted Test Status	OK / Okay, Malfunction, Not Run	This parameter contains the Fuel Tank Zone Module’s (FTZM) reported status of phase-to-phase short test
Fuel Pump Enable Circuit Open Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK / Okay if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Fuel Pump Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is shorted to voltage.
Fuel Pump Relay Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is shorted to ground.
Fuel Pump Relay Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is open.
Fuel Pump Speed Output Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the Fuel Pump Speed Output Circuit High Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
Fuel Pump Speed Output Circuit Low Voltage Test Status	OK / Okay , Malfunction, Not Run	This parameter displays the Fuel Pump Speed Output Circuit Low Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
Fuel Pump Speed Output Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the Fuel Pump Speed Output Circuit Open Circuit Test Status. Can display OK / Okay, Malfunction, or Not Run.
Fuel Pump Trim	%	This parameter displays the adjustments for the fuel pump duty cycle control. This is calculated by comparing the estimated fuel rail pressure to the desired fuel rail pressure. If the short term fuel pump trim consistently deviates from 0, the long term fuel pump trim is adjusted accordingly.
Fuel Rail Pressure Regulator Command (If Equipped)	Degrees	The scan tool displays in degrees, the Fuel Rail Pressure Regulator ON time as commanded by the control module.
Fuel Rail Pressure Sensor	MPa / psi	This parameter displays the high side fuel pressure after the high pressure pump.
Fuel Rail Pressure Sensor	Volts	This parameter displays the voltage signal received by the control module from the fuel rail pressure (FRP) sensor.
Fuel Rail Pressure Sensor Initial Learn	Complete	This parameter displays the if the Fuel Rail Pressure Sensor First Time Adaptation is Complete
Fuel Rail Pressure Sensor Learn	Active	This parameter displays the current state of the fuel rail pressure sensor learn condition.

Parameter	Value	Description
Fuel Rail Pressure Sensor Learn Inhibit	No	This parameter displays the reason for the fuel rail pressure sensor learn to be inhibited. These include: Assembly Plant Mode Counter Not Programmed, Assembly Plant Suspension, Barometric Pressure Sensor DTC, Barometric Pressure Too Low, Clutch Pedal Applied, Clutch Pedal Position Sensor DTC, Desired Fuel Rail Pressure Too Low, DTC Present, Engine in Catalyst Warm-Up Mode, Engine Not Synchronized, Engine Stopped, Fuel Pressure Spike, Fuel Level Too Low, Fuel Pressure Regulator Control Circuit DTC, Fuel Pump Control Function Active, Fuel Pump is Off, Fuel Rail Pressure Control Function Active, Fuel Rail Pressure Sensor DTC, Fuel System in Open Loop Operation, Fuel Temperature Out of Range, Idle Test Failed, Injector Flow Test in Progress, Intake Air Temperature Too Low, Low Pressure Fuel System Malfunction, Low Pressure Fuel System Pressure Too Low, Minimum Engine Run Time Not Met, Minimum Normal Fuel Pressure Control Time Not Met, Minimum Run Time, Time After New Engine Mode Not Met, Minimum Time After Drive Not Met, Minimum Time for Released Accelerator Pedal Not Met, New Engine Mode, Not in Control of Idle Speed, Other Diagnostics Active, Sensor Reading Too High Test Failed, Some Cylinders Are Turned Off, Stuck Sensor Test Failed, Vehicle Speed Too High
Fuel Rail Pressure Sensor Learn Status	Complete	This parameter displays several signals associated with the status of the power mode and starter systems.
Fuel Rail Pressure Sensor Learned Value	kPa	This parameter displays the fuel rail pressure learned value at the fuel rail pressure sensor.
Fuel Rail Temperature Sensor 1	ºC (ºF)	This parameter indicates the fuel rail temperature measured by the first sensor on the rail.
Fuel Rail Temperature Sensor 2	ºC (ºF)	This parameter indicates the fuel rail temperature measured by the second sensor on the rail.
Fuel System Monitor Complete	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and noncontinuous legislated emission related monitor.
Fuel System Monitor Complete This Ignition Cycle	No	This parameter displays the completion status of the fuel system monitor during the current driving / monitoring cycle.
Fuel System Monitor Enabled	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and noncontinuous legislated emission related monitor.
Fuel System Monitor Enabled This Ignition Cycle	No	This parameter displays the enable status of the fuel system monitor during the current driving / monitoring cycle.
Fuel Tank Pressure Sensor	kPa / psi	This parameter displays the pressure/vacuum inside the fuel tank. A negative value indicates a vacuum, while a positive value indicates a pressure.
Fuel Tank Pressure Sensor	mmHg / in H2O	This parameter displays the fuel tank pressure in mmHg/in H2O at the fuel tank pressure sensor.
Fuel Tank Pressure Sensor	Volts	This parameter displays the voltage signal received by the control module from the fuel tank pressure (FTP) sensor.
Fuel Tank Rated Capacity	Varies	This parameter displays the capacity of the fuel tank in liters or gallons. The rated capacity displayed by the scan tool will varies with vehicle type.
Fuel Trim Cylinder Balance Test or Fuel Trim Cylinder Balance Test Bank 1–2	Inactive	This parameter indicates the current state of the fuel trim cylinder balance test.

Parameter	Value	Description
Fuel Trim Cylinder Balance Test Counter or Fuel Trim Cylinder Balance Test Counter Bank 1-2	Counts	This parameter displays the number of Air Fuel Imbalance Monitor tests that have been performed since a code clear or non volatile memory (NVM) reset.
Fuel Trim Cylinder Balance Test Status Bank 1-2	No Result	This parameter indicates the current state of the fuel trim cylinder balance test.
Fuel Trim Learn	Enabled	This parameter displays Enabled when conditions are appropriate for enabling long term fuel trim corrections. This indicates that the long term fuel trim is adapting continuing amounts of short term fuel trim. If the scan tool displays Disabled, then long term fuel trim will not respond to changes in short term fuel trim.
Fuel Trim Learn	Enabled	This parameter displays if the fuel trim learn is enabled.
Fuel Trim Memory Cell	Counts 0–250	This parameter displays long term fuel corrections that is active based upon the current operating conditions (MAP, engine speed, purge duty cycle, A/C compressor state, and transmission range).
Fuel Trim Memory Cell	#	This parameter displays the intake air temperature (measured by a sensor located near the throttle body) recorded at power-up (Run/Crank transition from low to high).
Fuel Trim System Test State	Complete	This parameter displays the current state of the fuel adjustment system diagnostic.
Fuel Trim System Test State	Complete	This parameter displays the state of the fuel trim system test.
Fuel Volatility	Varies	This parameter indicates the rate the fuel can be vaporized in the cylinder as calculated by the control module. The scan tool will display HIGH when the fuel volatility is high. The scan tool will display LOW when the fuel volatility is low.
Generator F Terminal Signal	%	This parameter displays the amount of generator ON-time as commanded by the control module. The higher the percentage the greater the generator output.
Generator Indicator Command	On	This parameter displays On or Off associated with the status of the generator.
Generator L Terminal Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is shorted to voltage.
Generator L Terminal Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is shorted to ground.
Generator L Terminal Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is open.
Generator L-Terminal Command	%	This parameter displays the control modules commanded state of the voltage regulator on the generator.
Generator L-Terminal Signal Command	On / Off	This parameter displays the commanded state of the generator L-terminal output.
Heated Catalyst Monitor Complete	Yes	This parameter indicates the status of the heated catalyst. The scan tool displays Yes when the diagnostic is complete. And No if the diagnostic has not ran or a malfunction is detected in the heated catalyst.
Heated Catalyst Monitor Enabled	Yes	This parameter indicates the status of the heated catalyst monitor diagnostic. Catalyst Monitor Test Running indicates Yes or No when the heated catalyst monitor diagnostic is actively running a test.
Heater Coolant Pump Relay Command	On / Off	This parameter indicates if the heater core pump relay is commanded On or Off.

Parameter	Value	Description
Heater Coolant Pump Relay Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the Heater Coolant Pump Relay Control Circuit High Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
Heater Coolant Pump Relay Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the Heater Coolant Pump Relay Control Circuit Low Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
Heater Coolant Pump Relay Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the Heater Coolant Pump Relay Control Circuit Open Circuit Test Status. Can display OK / Okay, Malfunction, or Not Run.
High Side Driver 1 Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the High Side Driver 1 Circuit High Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
High Side Driver 1 Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the High Side Driver 1 Circuit Low Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
High Side Driver 1 Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the High Side Driver 1 Circuit Open Circuit Test Status. Can display OK / Okay, Malfunction, or Not Run.
High Side Driver 1 Command	On / Off	This parameter indicates if the High Side Driver 1 is being commanded On or Off.
High Side Driver 2 Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the High Side Driver 2 Circuit High Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
High Side Driver 2 Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the High Side Driver 2 Circuit Low Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
High Side Driver 2 Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the High Side Driver 2 Circuit Open Circuit Test Status. Can display OK / Okay, Malfunction, or Not Run.
High Side Driver 2 Command	On / Off	This parameter indicates if the High Side Driver 2 is being commanded On or Off.
Hood Position	Closed, Ajar, Open, Invalid	This parameter indicates the Position of the Hood.
Hood Position Switch	Closed	This parameter displays the current position of the hood.
HO2S Sensor 1 or HO2S Bank 1 Sensor 1 or Bank 2 Sensor 1	Volts	This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust.
HO2S Sensor 1 or HO2S Bank 1 Sensor 1 or Bank 2 Sensor 1	Lambda	This parameter displays the voltage output as a lambda value. When the fuel system is lean, the oxygen level will be high and the lambda signal will be high or more than 1. When the fuel system is rich, the oxygen level will be low, and the lambda signal will be low or less than 1. The ECM uses this information to maintain the correct air/fuel ratio
HO2S Sensor 2 or HO2S Bank 1 Sensor 2 or Bank 2 Sensor 2	Volts	This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust.
HO2S Heater Sensor 1 or HO2S Heater Bank 1 Sensor 1 or Bank 2 Sensor 1	Amps	This parameter display the current feedback for the oxygen sensor heater output for sensor 1.
HO2S Heater Sensor 2 or HO2S Heater Bank 1 Sensor 2 or Bank 2 Sensor 2	Amps	This parameter display the current feedback for the oxygen sensor heater output for sensor 2.

Parameter	Value	Description
HO2S Heater Command or HO2S Heater Command Bank 1 or 2 Sensor 1 or 2	Off	This parameter display the state of the HO2S heater control circuit as commanded by the control module.
HO2S Heater Command Bank 1 or 2 Sensor 1 or 2 Heater Command	%	This parameter displays the HO2S heater ON time in percentage, as commanded by the control module.
HO2S Heater Control Circuit High Voltage Test Status or HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	OK / Okay , Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
HO2S Heater Control Circuit High Voltage Test Status or HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	OK / Okay , Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
HO2S Heater Control Circuit Low Voltage Test Status or HO2S Heater Control Circuit Low Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	OK / Okay, Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
HO2S Heater Control Circuit Low Voltage Test Status or HO2S Heater Control Circuit Low Voltage Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	OK / Okay, Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
HO2S Heater Control Circuit Open Test Status or HO2S Heater Control Circuit Open Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	OK / Okay, Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is open.
HO2S Heater Control Circuit Open Test Status or HO2S Heater Control Circuit Open Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	OK / Okay, Malfunction	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is open.
HO2S/Heater Monitor Complete This Ignition Cycle	Yes/No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
HO2S Heater Monitor Enabled	No	This parameter displays the current state of the H02S heater monitor.
HO2S/Heater Monitor Enabled This Ignition Cycle	Yes/No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
Humidity Sensor Intake Air Temperature Signal	Hz	This parameter displays the frequency of the humidity sensor’s intake air temperature (IAT) sensor input.
IAT Sensor 1	°C (°F)	This parameter displays the temperature of the air entering the air induction system based on input to the control module from the intake air temperature (IAT) sensor.
IAT Sensor 2	Hz	This parameter displays the frequency of the humidity sensor’s intake air temperature (IAT) sensor input to the engine control module.

Parameter	Value	Description
IAT Sensor 2	°C (°F)	This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor 2. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high.
IAT Sensor 3	°C (°F)	This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor 3. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high.
Idle Speed Correction	RPM	This parameter displays the engine idle speed correction within a restricted range to address complaints of vehicle vibration.
Ignition 1 Signal	B+	This parameter displays B+ when the control module detects a voltage at the ignition 1 input terminal.
Ignition Accessory Signal	On	This parameter displays On when the control module detects a voltage at the ignition accessory input terminal.
Ignition Coil 1,2,3,4,5,6,7, or 8 Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Ignition control circuit. The parameter displays Malfunction if the Ignition control circuit is shorted to voltage.
Ignition Coil 1,2,3,4,5,6,7, or 8 Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the Ignition control circuit. The parameter display Malfunctions if the Ignition control circuit is shorted to ground.
Ignition Coil 1,2,3,4,5,6,7, or 8 Control Circuit Open Test Status	OK / Okay, Malfunction	This parameter displays the state of the Ignition control circuit. The parameter displays if Malfunction the Ignition control circuit is open.
Ignition Coil Supply Voltage or Ignition Coil Supply Voltage Bank 1 or 2	On	This parameter displays ON when voltage is supplied to the Ignition coil.
Ignition Cycles Since Recommended Maximum Fuel Alcohol Content Exceeded	Counts	This parameter displays the number of Ignition Cycles since Recommended Maximum Fuel Alcohol Content Exceeded.
Ignition Cycles with Malfunction Since 1st Malfunction	Counts	This parameter contains the number of ignition cycles with a failure reported since the first ignition cycle with a failure reported.
Ignition Cycles Without Completed Test Since 1st Malfunction	Counts	This parameter displays the number of ignition cycles without a pass or a failure reported since the first ignition cycle with a failure reported.
Ignition Cycles Without Malfunction Since Last Malfunction	Counts	This parameter displays the number of ignition cycles with a pass reported and no malfunctions reported since the first ignition cycle with a malfunction reported.
Ignition Cycles without Malfunction Since Last Malfunction	Counts	This parameter contains the number of ignition cycles with a pass reported and no failures reported since the first ignition cycle with a failure reported.
Ignition Off Time	hh:mm:ss	This parameter displays the time that the ignition has been OFF.
Ignition Timing	Degrees	This parameter displays the final spark advance in terms of a crankshaft angle.
Immobilizer Auto Learn Counter	Counts	This parameter displays the number of auto-learn cycles that have been successfully completed within the immobilizer system.
Immobilizer Automatic Learn Timer	h/m/s	This parameter displays the time elapsed within the current auto-learn cycle within the immobilizer system.
Immobilizer ECM Identifier	OK / Okay	This parameter displays that the immobilizer control module (ICM) has received the correct powertrain identifier.

Parameter	Value	Description
Immobilizer Environment Device 1-4	OK / Okay	This parameter displays that the associated device is OK / Okay or unknown or its identification is pending to the immobilizer control module (ICM).
Immobilizer Fuel Disable	Inactive	This parameter displays if the vehicle is immobilized by the ECM.
Immobilizer Module Environment Identification	Inactive	This parameter displays that the ICM has not received the powertrain identifier or has received the wrong powertrain identifier.
Immobilizer Module Fuel Disable	Inactive	This parameter displays if the vehicle is immobilized by the ICM.
Immobilizer Module Identification	Complete	This parameter indicates that the ICM has not received the powertrain identifier or has received the wrong powertrain identifier.
Immobilizer Module Security Code Programmed	Yes	This parameter indicates that the ICM security code has been programmed (i.e., the immobilizer device is locked).
Immobilizer Password Learn	Active/Inactive	Learning Enabled indicates that learning of immobilizer code information is enabled.
Immobilizer Password Learn Scan Tool Delay	Active/Inactive	Scan tool Learn Delay Active indicates that the security code has been accepted but the scan tool learn delay is active and will not allow learning enabled, programming security code, or resetting security code.
Immobilizer Password Programmed	Yes	This parameter indicates that the ICM password has been programmed.
Immobilizer Post-Release Passive State	Active / Inactive	This parameter displays that the immobilizer algorithm is in the post release passive state.
Immobilizer Post-Release State	Active / Inactive	This parameter displays that the immobilizer algorithm is in the post release passive state.
Immobilizer Pre-Release State	Active / Inactive	This parameter displays that the immobilizer algorithm is in the pre release active state.
Immobilizer Release State	Active / Inactive	This parameter displays that the immobilizer algorithm is in the release active state.
Immobilizer Security Code Accepted	Yes/No	Security Code Accepted displaying Yes indicates' that the received security code is correct.
Immobilizer Security Code Function	Present/Not Present	This parameter indicates if the ECU supports the immobilizer security code strategy.
Immobilizer Security Code Lockout	Yes/No	Security Code Lockout Active indicates that the security code has not passed and lockout is active.
Immobilizer Security Code Lockout Active Timer	ms	This parameter displays the time elapsed since the immobilizer security code lockout has been activated either due to a battery disconnect or an incorrect immobilizer security code being entered.
Immobilizer Security Code Programmed	Yes/No	Security Code Programmed indicates that the security code has been programmed.
Immobilizer Security Code Programming Counter	Counts	This parameter displays the number of times a new immobilizer security code has been programmed through secure access. This counter can only be incremented.
Immobilizer Security Code Reset Counter	Counts	This parameter displays the number of times the immobilizer security code has been reset to the default value through secure access. This counter can only be incremented.
Immobilizer Security Information Programmed	Yes/No	This parameter displays the status of the immobilizer system.
Immobilizer Security Level	#	This parameter displays the current immobilizer security level. If the correct security code is entered, the security level will remain at or be reset to a level of 10. If an incorrect security code is entered, the security level will be set to a level of 9.

Parameter	Value	Description
Immobilizer Transponder Identification	Active / Inactive	This parameter displays that the transponder identification process is active within the ICM.
Immobilizer Transponder Key	OK / Okay	This parameter displays that the transponder key is correct for the ICM.
Immobilizer Transponder Key Identification	OK / Okay	This parameter displays that the transponder key identification process is active within the ICM.
Immobilizer System Status	Varies	This parameter displays the status of the immobilizer system, the following maybe displayed. Standby, Immobilized at Startup, Immobilized, No Response, Immobilized Negative Response, Immobilized, Incorrect Response, Post-Release State, Pre-Release State, Release State.
Immobilizer Valid Response Received Time	ms	This parameter displays the actual time observed for a valid immobilizer response.
Initialized Fuel Alcohol Content	%	This parameter displays the initialized fuel composition to be used as a starting point for the fuel composition algorithm.
Injector Duty Cycle or Injector Duty Cycle Bank 1 or 2	ms	This parameter displays the amount of fuel injector ON time or pulse width as commanded by the control module.
Inspection/Maintenance Drive Cycle Complete	Yes/No	Inspection/Maintenance Drive Cycle Complete means that all required components of the standard drive cycle have completed.
Inspection/Maintenance Drive Cycle Idle Time Complete	Yes/No	Inspection/Maintenance Drive Cycle Idle Time Complete indicates that the engine idle time requirement is complete.
Inspection/Maintenance Drive Cycle Idle Timer	hh:mm:ss	This parameter displays the Inspection/Maintenance Drive Cycle Idle Timer.
Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete	Yes/No	This parameter displays the Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete. The parameter displays Yes when the Inspection/Maintenance Drive Cycle Propulsion System Active Time is Complete.
Inspection/Maintenance Drive Cycle Propulsion System Active Timer	hh:mm:ss	This parameter displays the total accumulated time in which the propulsion system has been active after the 1st time the engine is started.
Inspection/Maintenance Drive Cycle Vehicle Speed Time Complete	Yes/No	This parameter displays Yes when the Vehicle Speed Time Complete indicates that the vehicle has been above 25 mph for five minutes.
Inspection/Maintenance Drive Cycle Vehicle Speed Timer	hh:mm:ss	This parameter displays the total accumulated time in which the vehicle speed has been greater than 25 mph after the 1st time the engine is started.
Intake Air Humidity Sensor	%	This parameter displays the raw duty cycle signal from the relative humidity sensor electronics, which represents the relative humidity of the intake air.
Intake Camshaft Position	°	This parameter displays the position of the intake camshaft for bank 1 in terms of degrees of camshaft rotation (advance) from the park position (a value of zero represents the park position).
Intake Camshaft Position Active Counter or Intake Camshaft Position Active Counter Bank 1 or 2	0–255	This parameter displays an incrementing counter when the control module receives a signal from the intake camshaft position (CMP) sensor.
Intake Camshaft Position Actuator Oil Pressure	kPa	This parameter displays the oil pressure at the intake camshaft position actuator.
Intake Camshaft Position Actuator Oil Pressure Sensor	Volts	This parameter displays the intake camshaft position actuator pressure sensor in voltage.

Parameter	Value	Description
Intake Camshaft Position Actuator Park Lock Solenoid Valve Command Bank 1	Locked / Unlocked	This parameter indicates if the Intake Camshaft Position Actuator Park Lock Solenoid Valve for Bank 1 is Locked or Unlocked.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Command Bank 2	Locked / Unlocked	This parameter indicates if the Intake Camshaft Position Actuator Park Lock Solenoid Valve for Bank 2 is Locked or Unlocked.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 1	OK / Okay, Malfunction, Not Run	This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 1. Can display OK / Okay, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 2	OK / Okay, Malfunction, Not Run	This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit High Voltage Test Status Bank 2. Can display OK / Okay, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 1	OK / Okay, Malfunction, Not Run	This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 1. Can display OK / Okay, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 2	OK / Okay, Malfunction, Not Run	This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Low Voltage Test Status Bank 2. Can display OK / Okay, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Test Status Bank 1	OK / Okay, Malfunction, Not Run	This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Circuit Test Status Bank 1. Can display OK / Okay, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Test Status Bank 2	OK / Okay, Malfunction, Not Run	This parameter displays the Intake Camshaft Position Actuator Park Lock Solenoid Valve Control Circuit Open Circuit Test Status Bank 2. Can display OK / Okay, Malfunction, or Not Run.
Intake Camshaft Position Actuator Park Lock Test Abort Reason Bank 1	N/A	This parameter indicates the reason why the Intake Camshaft Actuator Park Lock Pin Test for Bank 1 was aborted.
Intake Camshaft Position Actuator Park Lock Test Abort Reason Bank 2	N/A	This parameter indicates the reason why the Intake Camshaft Actuator Park Lock Pin Test for Bank 2 was aborted.
Intake Camshaft Position Actuator Park Lock Test Status Bank 1	N/A	This parameter indicates the status of the intake camshaft actuator park lock pin test for bank 1.
Intake Camshaft Position Actuator Park Lock Test Status Bank 2	N/A	This parameter indicates the status of the intake camshaft actuator park lock pin test for Bank 2.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status or Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status Bank 1 or 2	OK / Okay, Malfunction	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to voltage.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status or Intake Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 or 2	OK / Okay, Malfunction	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to ground.

Parameter	Value	Description
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status or Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status Bank 1 or 2	OK / Okay, Malfunction	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is open.
Intake Camshaft Position or Intake Camshaft Position Bank 1 or 2	Degrees	This parameter displays the actual intake camshaft position in degrees.
Intake Camshaft Position Commanded or Intake Camshaft Position Commanded Bank 1 or 2	%	This parameter displays the ON-time or duty cycle of the intake camshaft position (CMP) actuator solenoid valve as commanded by the control module.
Intake Camshaft Position Variance or Intake Camshaft Position Variance Bank 1 or 2	Degrees	This parameter displays in degrees, the difference between the desired intake camshaft position and the actual intake camshaft position.
Intake Camshaft Profile Actuator 1–8 Command	On / Off	This parameter displays the commanded state of the Intake Camshaft Profile Actuator output.
Intake Camshaft Profile Actuator 1–8 Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Intake Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Intake Camshaft Profile Actuator control circuit is shorted to voltage.
Intake Camshaft Profile Actuator 1–8 Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Intake Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Intake Camshaft Profile Actuator control circuit is shorted to ground.
Intake Camshaft Profile Actuator 1–8 Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Intake Camshaft Profile Actuator control circuit per cylinder. The parameter displays Malfunction if the Intake Camshaft Profile Actuator control circuit is open.
Intake Camshaft Profile Actuator Position Sensor 1–4	%	This parameter displays the commanded duty cycle for the Intake Camshaft Profile Actuator.
Intake Camshaft Profile Actuator Position Sensor 1–4	mm	This parameter displays the commanded duty cycle for the Intake Camshaft Profile Actuator.
Intake Camshaft Profile Sleeve Position Sensor 1, 2	Counts	This parameter displays the number of times that the Intake Camshaft Profile Sleeve test has been activated during the current key cycle.
Intake Manifold Pressure	kPa/psi	This parameter displays the engine intake manifold vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and intake manifold absolute pressure (MAP).
Intake Manifold Tuning Control Valve Control Circuit Command	On	This parameter displays the commanded state of the intake manifold tuning valve output.
Intake Manifold Tuning Control Valve Control Circuit High Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the intake manifold tuning control valve control circuit. The parameter displays Malfunction if the intake manifold tuning control valve control circuit is shorted to voltage.
Intake Manifold Tuning Control Valve Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to ground.

Parameter	Value	Description
Intake Manifold Tuning Control Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is open.
Intake Manifold Tuning Control Valve Feedback Signal	%	This parameter displays the duty cycle of the PWM feedback from the intake manifold tuning electronics, which represents the position of the intake manifold tuning valve.
Intake Manifold Tuning Control Valve Learn	Inactive	This parameter displays that the intake manifold tuning electronics are currently learning the hard stop position for the intake manifold tuning valve.
Intake Manifold Tuning Control Valve Position	Closed	This parameter displays whether the intake manifold tuning valve is in an open, closed, or intermediate position based upon the PWM feedback from the intake manifold tuning electronics.
Intake Rocker Arm Solenoid Valve 1–2 Command	Off	This parameter displays the intake rocker arm solenoid valve command ON/OFF status.
Intake Rocker Arm Solenoid Valve 1–2 Command	High Lift/Low Lift	This parameter displays the intake rocker arm solenoid valve command status.
Intake Rocker Arm Solenoid Valve 1–2 Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the intake rocker arm solenoid valve control circuit. The parameter displays Malfunction if the intake rocker arm solenoid valve circuit is shorted to voltage.
Intake Rocker Arm Solenoid Valve 1–2 Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the intake rocker arm solenoid valve control circuit. The parameter displays Malfunction if the intake rocker arm solenoid valve control circuit is shorted to ground.
Intake Rocker Arm Solenoid Valve 1–2 Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the intake rocker arm solenoid valve control circuit. The parameter displays Malfunction if the intake rocker arm solenoid valve control circuit is open.
ISS/OSS Supply Voltage	OK / Okay , Malfunction	This parameter displays the state of the ISS/OSS Supply Voltage circuit.
Knock Retard	Degrees	This parameter indicates the amount of spark advance the control module removes from the ignition control (IC) spark advance in response to the signal from the knock sensors.
Long Term Fuel Pump Trim	#	This parameter displays a numeric value. This is the long term (LT) fuel pump trim.
Long Term Fuel Trim or Long Term Fuel Trim Bank 1 or 2	%	This parameter displays the commanded Long Term Fuel Trim correction by the control module for cruise and acceleration conditions.
Long Term Fuel Trim Test Average or Long Term Fuel Trim Test Average Bank 1 or 2	%	This parameter displays the filtered long term closed loop fuel correction. This value is compared to thresholds to determine if the fuel adjustment system diagnostic is passing or failing or if an excess purge vapor test should be executed.
Long Term Fuel Trim Test Average without Purge or Long Term Fuel Trim Test Average without Purge Bank 1 or 2	%	This parameter displays the filtered non purge long term closed loop fuel correction. This value is compared to thresholds to determine if the fuel adjustment system diagnostic is passing, failing, or indeterminate during normal purge-OFF operation as well as during the intrusive excess purge vapor test.
Long Term Secondary O2 Sensor Fuel Trim Bank 1 or 2	%	This parameter displays the Long Term Secondary O2 Sensor Fuel Trim for Bank 1 or 2.
Lost Communication with Active Grille Air Shutter Actuator Test Status	OK / Okay, Malfunction, Not Run	This parameter indicates the status of the Active Grille Air Shutter actuator diagnostic test.
Low Engine Oil Level Indicator Command	Off	The scan tool displays On or Off. This is the state of the low engine oil level indicator as monitored by the ECM.

Parameter	Value	Description
Low Engine Oil Pressure Indicator Command	Off	This parameter displays the commanded state of the low EOP lamp control circuit by the control module.
Low-Voltage Battery Current	Amps	This parameter displays the battery current.
Low-Voltage Battery State of Charge	Volts	This parameter indicates the percentage of the battery charge remaining.
Low-Voltage Battery State of Function	Volts	This parameter displays the predicted minimum voltage of the next crank event.
Low-Voltage Battery State of Health	Volts	This parameter indicates the available capacity of the battery if it were fully charged, relative to the capacity when the battery was new.
Low-Voltage Battery Temperature	ºC (ºF)	This parameter indicates the temperature of the battery.
MAF Performance Test	OK / Okay	This parameter displays the status of the MAF performance test by the engine control module. The scan tool will display OK / Okay if no malfunction is found. The scan tool will display malfunction if the engine control module detects a malfunction during the test.
MAF Sensor	g/s	This parameter displays in grams per second, the measured quantity of air flowing into the engine during all operating conditions.
MAF Sensor	Hz	The scan tool displays a range of 0-65,555 hertz. This parameter displays the frequency signal input to the control module, and represents measured quantity of air flowing into the engine during all operating conditions.
MAF Sensor Supply Voltage Command	On / Off	This parameter indicates if the mass air flow sensor supply voltage is commanded On or Off.
MAF Sensor Supply Voltage Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the mass air flow sensor supply voltage Control Circuit High Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
MAF Sensor Supply Voltage Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the mass air flow sensor supply voltage Control Circuit Low Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
MAF Sensor Supply Voltage Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the mass air flow sensor supply voltage Control Circuit Open Circuit Test Status. Can display OK / Okay, Malfunction, or Not Run.
MAF When Engine Overspeed Detected	g/s	This parameter indicates the quantity calculated by the control module based on a signal from the MAF sensor at the time an overspeed was detected.
MAP Performance Test 1	OK / Okay	MAP Test 1 Residual Out of Tolerance indicates that the filtered MAP Test 1 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the mass airflow predicted from the throttle model) exceeds a failure threshold.
MAP Performance Test 2	OK / Okay	MAP Test 2 Residual Out of Tolerance indicates that the filtered MAP Test 2 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the measured mass airflow) exceeds a failure threshold.
MAP Sensor	kPa/psi	This parameter displays the actual engine intake manifold absolute pressure (MAP).
MAP Sensor	Volts	The parameter displays The MAP sensor voltage as it measures the change in the intake manifold pressure which results from engine load and speed changes. As the intake manifold pressure increases, the air density in the intake also increases and additional fuel is required.
Maximum Engine Speed When Engine Overspeed Detected	RPM	This parameter displays the Maximum Engine Speed When Engine Overspeed Detected.

Parameter	Value	Description
MIL Command	Off	This parameter displays the commanded state of the malfunction indicator lamp (MIL) control circuit by the control module.
MIL Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to voltage.
MIL Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to ground.
MIL Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is open.
MIL Requested	No	This parameter displays the reason the engine control module illuminated the MIL. The scan tool will display Yes when the MIL is requested as a result of an A or B type DTC. The scan tool will display No if the MIL is illuminated for another reason, such as transmission DTCs.
MIL Requested by DTC	No	This parameter indicates the reason the control module illuminated the MIL. The scan tool will display YES when the MIL is requested as a result of an A or B type DTC. The scan tool will display NO if the MIL is illuminated for another reason, such as transmission DTCs.
Minimum DC/DC Converter Output Voltage on Circuit 1 - Last Engine Crank	Volts	This parameter indicates the minimum DC/DC Converter Output Voltage on Circuit 1 on the last engine crank.
Minimum DC/DC Converter Output Voltage on Circuit 2 - Last Engine Crank	Volts	This parameter indicates the minimum DC/DC Converter Output Voltage on Circuit 2 on the last engine crank.
Misfire Diagnostic Engine Load	%	This parameter displays the engine load used within the misfire diagnostic (calculated as the ratio of the mass of air predicted to be in the cylinder two firing events into the future to the maximum possible mass of air in the cylinder based on the current ambient air pressure and charge temperature).
Misfire Diagnostic Engine Speed	RPM	This parameter displays the engine speed used within the misfire diagnostic. This engine speed is the maximum engine speed observed over the previous engine cycle.
Misfire Engine Load History 1–5	%	This parameter displays the specific engine load when the engine was operating for one of the last five misfire events .
Misfire Engine Speed History 1–5	RPM	This parameter displays the specific engine speed when the engine was operating for one of the last five misfire events .
Misfire Monitor Complete	Yes/No	This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Complete.
Misfire Monitor Complete This Ignition Cycle	No	This parameter displays the completion status of the misfire monitor during the current driving / monitoring cycle.
Misfire Monitor Enabled	Yes/No	This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Enabled.
Misfire Monitor Enabled This Ignition Cycle	No	This parameter displays the enable status of the misfire monitor during the current driving / monitoring cycle.
Neutral Position Sensor	°	This parameter displays the current state of the neutral position sensor in degrees.
Number of Calibration History Events Stored	Counts	This parameter displays the history entries for the primary calibration in the controller.
Number of DTC(s)	#	This parameter indicates the number of diagnostic trouble codes (DTCs).

Parameter	Value	Description
O2S/HO2S Monitor Complete	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Complete This Ignition Cycle	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Enabled	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Enabled This Ignition Cycle	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
Odometer at Engine Shutdown – Excessive Idle Time	km / mi	This parameter displays the odometer reading at an engine shutdown due to excessive idle time.
Odometer at Engine Shutdown – High Coolant Temperature	km / mi	This parameter displays the odometer reading at an engine shutdown due to high coolant temperature.
Odometer at Engine Shutdown – Low Coolant Level	km / mi	This parameter displays the odometer reading at an engine shutdown due to low coolant level.
Odometer at Engine Shutdown – Low Oil Level	km / mi	This parameter displays the odometer reading at an engine shutdown due to low oil level.
Odometer When Engine Overspeed Detected	km / mi	This parameter displays the kilometers or miles of the Odometer When Engine Overspeed Detected.
Oil Level Warning Counter City	Counts	This parameter displays a rolling count of oil level debounce events for the city calibration.
Oil Level Warning Counter Country Road	Counts	This parameter displays a rolling count of oil level debounce events for the country road calibration
Oil Level Warning Counter Highway	Counts	This parameter displays a rolling count of oil level debounce events for the highway calibration.
Output Shaft Speed Sensor	RPM	This parameter displays the transmission output speed.
Park/Neutral Position Switch (If Equipped)	Park/Neutral	This parameter indicates the range selection of the automatic transmission as calculated by the control module based on input from the PNP switch. The scan tool will display, In Gear, Park, or Neutral depending on the PNP switch position.
Park/Neutral Position Switch (RPO=MO5)	Active/Inactive	This parameter indicates the status of the Park/Neutral Position (PNP) Switch. When in Park, the PNP Switch is closed and the scan tool will display active. When in Reverse, Neutral, or Drive, the PNP Switch is open and the scan tool will display inactive.
Power Enrichment	Inactive	This parameter indicates if the control module has detected conditions appropriate to operate in Power Enrichment mode. The scan tool will display Active if the mode is in operation, and Inactive if the mode is not in operation. The control module enters Open Loop operation and increases injector pulse width when in power enrichment mode.
Power Mode	Run	This parameter displays the state of the System Power Mode. This signal is based upon the state of the system power mode received over serial communication from the vehicle electronics. If the serial data signal not received, the Parameter will display Off.
Radiator Coolant Temperature Sensor	Varies C° (F°)	This parameter displays the undefaulted radiator coolant temperature measured by a sensor located in the coolant outlet of the radiator.

Parameter	Value	Description
RCT vs. IAT Sensor Temperature at Last ECT vs. RCT Malfunction Detection	Agree	This parameter displays that the temperature values of the RCT and IAT sensors did not agree at the time of the most recent failure of the ECT/RCT rationality diagnostic.
Recommended Maximum Fuel Alcohol Content	%	This parameter displays the percentage of the Recommended Maximum Fuel Alcohol Content.
Recommended Maximum Fuel Alcohol Content Exceeded	No	This parameter displays Yes or No if the Recommended Maximum Fuel Alcohol Content Exceeded.
Recommended Maximum Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded	%	This parameter displays the percentage of the Recommended Maximum Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded.
Reduced Engine Power	Inactive	This parameter displays Active if the control module is commanding reduced engine power due to a throttle actuator control (TAC) system condition.
Reduced Engine Power History	Throttle Malfunction, Cooling Fan Malfunction, Engine Over-temperature Protection Active, Engine Oil Temperature Too High, Remote Vehicle Speed Limiting, Engine Calibration Malfunction, Engine Oil Life, High Pressure Fuel System Malfunction	This parameter displays the last reason that Powertrain has illuminated the Reduced Engine Power (REP) indication.
Redundant Odometer Memory	Present	ECU Odometer Programmed indicates if the ECU odometer value has been programmed.
Refueling Events Since Recommended Maximum Fuel Alcohol Content Exceeded	Counts	This parameter displays the number Refueling Events Since Recommended Maximum Fuel Alcohol Content Exceeded.
Remaining Fuel in Tank	%	This parameter displays the total fuel level as a percentage of the rated capacity of the fuel tank.
Remaining Fuel in Tank	Liters/Gallons	This parameter displays the actual total fuel volume contained in the fuel tank.
Remote Vehicle Start Disable History 1–8	Reason for RVS Disable	These parameters displays the last eight reasons the control module disabled remote vehicle start (RVS).
Remote Vehicle Start Request Signal	Off	Remote Vehicle Start Request indicates the state of the request received over serial communication from the remote vehicle start (RVS) system to start the vehicle in remote mode.
Replicated Transmission OSS Signal	RPM	This parameter displays the Replicated Transmission Output Speed (Replicated TOS) received from the Transmission Control Module.
Reverse Inhibit Solenoid Actuator Command	Allowed	This parameter displays that the driver is inhibited from shifting into reverse.
Reverse Inhibit Solenoid Actuator Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is shorted to voltage.
Reverse Inhibit Solenoid Actuator Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is shorted to ground.
Reverse Inhibit Solenoid Actuator Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is open.
Reverse Position Switch	Off	This parameter displays if the manual transmission shifter is in reverse.
Secondary Air Injection Monitor Enabled	Yes	This parameter displays the status of the secondary air injection monitor.

Parameter	Value	Description
Secondary Air Injection Pressure	kPa	This parameter displays the normalized secondary air injection system pressure.
Secondary Air Injection Pressure Sensor	kPa	This parameter displays the unfiltered secondary air injection system pressure.
Secondary Air Injection Pressure Sensor	Volts	This parameter displays the secondary air injection system pressure analog input as a percentage of its reference voltage.
Secondary Air Injection Pressure Sensor Variance	kPa	This parameter displays the weighted average pressure error (difference between the predicted and actual secondary air injection system pressure) during the secondary air injection on test (phase 1).
Secondary Air Injection Pump Relay Command	Off	This parameter displays the commanded state of the secondary air injection pump output.
Secondary Air Injection Pump Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is shorted to voltage.
Secondary Air Injection Pump Relay Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is shorted to ground.
Secondary Air Injection Pump Relay Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is open.
Secondary Air Injection Solenoid Valve Command	Off	This parameter displays the commanded state of the secondary air injection valve output.
Secondary Air Injection Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is shorted to voltage.
Secondary Air Injection Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is shorted to ground.
Secondary Air Injection Solenoid Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is open.
Short Term Fuel Pump Trim	#	This parameter displays a numeric value. This is the short term (ST) fuel pump trim.
Short Term Fuel Trim or Short Term Fuel Trim Bank 1 or Bank 2	%	This parameter displays the short-term correction to the fuel delivery by the control module in response to oxygen sensor 1 or 2. If the oxygen sensor indicates a lean air/fuel mixture, the control module will add fuel increasing the short term fuel trim above 0. If the oxygen sensor indicates a rich air/fuel mixture, the control module will reduce fuel decreasing the short term fuel trim below 0.
Short Term Fuel Trim Test Average or Short Term Fuel Trim Test Average Bank 1 or Bank 2	%	This parameter display's the filtered short term closed loop fuel correction. This value is compared to thresholds to determine if the fuel adjustment system diagnostic is passing or failing or if an excess purge vapor test should be executed.
Short Term Secondary O2 Sensor Fuel Trim Bank 1 or 2	%	This parameter displays the Short Term Secondary O2 Sensor Fuel Trim for Bank 1 or 2.
Skip Shift Solenoid Actuator Command	No Skip	This parameter indicates that the skip shift solenoid is commanded on, inhibiting the driver from shifting up to one of the next highest gears.

Parameter	Value	Description
Skip Shift Solenoid Actuator Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to voltage.
Skip Shift Solenoid Actuator Control Circuit Low Voltage Test Status	OK / Okay, Malfunction	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to ground.
Skip Shift Solenoid Actuator Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is open.
Specific Humidity	%	This parameter shows the current specific humidity level.
Starter Pinion Solenoid Actuator Relay Command	On / Off	This parameter indicates the commanded state of the Starter Pinion Solenoid Actuator relay.
Starter Pinion Solenoid Actuator Relay Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit High Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
Starter Pinion Solenoid Actuator Relay Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit Low Voltage Test Status. Can display OK / Okay, Malfunction, or Not Run.
Starter Pinion Solenoid Actuator Relay Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the Starter Pinior Solenoid Actuator Relay Control Circuit Open Circuit Test Status. Can display OK / Okay, Malfunction, or Not Run.
Starter Relay Command	On / Off	This parameter indicates whether the control module is commanding the starter relay to go On or Off.
Starter Relay Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the relay control circuit On.
Starter Relay Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the relay control circuit On.
Starter Relay Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is open. This parameter may not change if the scan tool is used to command the relay control circuit On.
Start-Up ECT	°C (°F)	This parameter displays the temperature of the engine coolant on start-up based on input to the control module from the ECT sensor.
Start-Up Fuel Rail Temperature	ºC (ºF)	This parameter indicates the fuel rail temperature when the engine was started from the first sensor located on the fuel rail.
Start-Up Fuel Rail Temperature 1	ºC (ºF)	This parameter indicates the fuel rail temperature when the engine was started from the first sensor located on the fuel rail.
Start-Up Fuel Rail Temperature 2	ºC (ºF)	This parameter indicates the fuel rail temperature when the engine was started from the second sensor located on the fuel rail.
Start-Up IAT Sensor or Start-Up IAT Sensor 1 or 2	°C (°F)	This parameter displays the temperature of the intake air at start in the air induction system based on input to the control module from the IAT sensor.
Start-Up IAT Sensor 3	ºC (ºF)	This parameter indicates the intake air temperature when the engine was started.

Parameter	Value	Description
Stop/Start Disable Mode	Active / Inactive / Not Available	This parameter indicates the status of the Stop/Start Disable Mode.
Supercharger Bypass Solenoid Valve Command	%	This parameter displays the commanded duty cycle for the supercharger boost solenoid output.
Supercharger Bypass Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is shorted to voltage.
Supercharger Bypass Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is shorted to ground.
Supercharger Bypass Solenoid Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is open.
Supercharger Inlet Pressure	kPa	This parameter displays the supercharger inlet vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and supercharger inlet absolute pressure (SCIAP).
Supercharger Inlet Pressure Sensor	kPa	This parameter displays the unfiltered supercharger inlet absolute pressure (SCIAP).
Supercharger Inlet Pressure Sensor	Volts	This parameter displays the supercharger inlet absolute pressure (SCIAP) analog input as a percentage of its reference voltage.
SVS Indicator Command	Off	This parameter displays that the Service Vehicle Soon lamp is being commanded on due to the failure of a non emission related diagnostic test.
System Off	No	This parameter displays that the vehicle is waiting for a key crank to happen (key crank not done yet).
TAC Forced Engine Shutdown	No	This parameter indicates the status of the TAC motor by the control module. The scan tool will display Yes if the engine has been shut down due to a throttle control fault.
TAC Motor	Enabled	This parameter indicates the status of the throttle actuator control (TAC) motor driver in the control module. The scan tool will display Enabled if TAC motor operation is allowed. The scan tool will display Disabled if the control module detects a condition that affects TAC motor operation.
TAC Motor Command	%	This parameter displays the commanded duty cycle for the throttle actuator output.
TCC/Cruise Control Brake Pedal Switch	Applied / Released	This parameter indicates the state of the TCC/Cruise Control Brake Pedal Switch.
Throttle Body Idle Air Flow Compensation	%	This parameter displays the percent compensation of the Learned Airflow Variation Calibration. This value indicates the current amount of airflow compensation in response to engine intake airflow restrictions. It can also be used as feedback for the Learned Airflow Adapts Reset Trigger Device Control.
Throttle Position	%	This parameter displays the desired throttle position angle commanded by the control module.
Throttle Position Performance Test	OK / Okay , Malfunction	Throttle Position Residual Out of Tolerance indicates that the filtered throttle position residual (the product of the MAF residual and the MAP Test 1 residual) exceeds a failure threshold.
Throttle Position Sensor 1	Volts	This parameter displays the actual voltage on the TP sensor 1 signal circuit as measured by the control module.
Throttle Position Sensor 1 Learned Minimum	Volts	This parameter displays the learned minimum value of throttle position (TP) sensor 1 as recorded by the control module during the last learn procedure.

Parameter	Value	Description
Throttle Position Sensor 1 or 2 Position	%	This parameter displays the actual voltage on the TP sensor 2 signal circuit as measured by the control module.
Throttle Position Sensor 2	Volts	This parameter displays the voltage signal sent to the control module from TP sensor 2 of the throttle assembly. The TP sensor 2 is a range of values indicating a low voltage when the throttle is closed to a high voltage when the throttle plate is fully open.
Throttle Position Sensor 2 Learned Minimum	Volts	This parameter displays the learned minimum value of TP sensor 2 as recorded by the control module during the last learn procedure.
Throttle Position Sensors 1 and 2	Agree	This parameter displays Disagree when the control module detects that TP sensor 1 voltage signal is not within the correct relationship to TP sensor 2. The scan tool displays Agree under the normal operating conditions.
Tire Size	Rev / km	This parameter displays the vehicle tire circumference in centimeters.
Torque Delivered Signal	N•m /Lb/Ft	This parameter displays the engine torque based upon the airflow through the engine and the torque losses due to spark retard and fuel shutoff. Since this is a steady state engine torque, it does not include the inertial component of engine torque.
Torque Management Ignition Timing Retard	Degrees	This parameter displays the total spark retard (in terms of a crankshaft angle).
Torque Request Inhibit – Fuel	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Ignition Timing	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Ignition Timing Advance	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Minimum Idle	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Minimum Torque	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – TAC	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – TAC Limit	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Total Alternative Fuel Level Percentage	%	This parameter displays the undefaulted, total alternative fuel level as a percentage of the rated (advertised) capacity of the alternative fuel tank(s).
Total Engine Mass Air Flow	g/s	This parameter indicates the engine mass airflow.
Total Engine Overspeed Time	ms	This parameter displays the Total Engine Overspeed Time.
Total Knock Retard	Degrees	This parameter displays how much ignition spark timing is being retarded due to all control systems monitored by the control module.
Total Misfire	#	This parameter displays the total number of cylinder firing events that the control module detected as misfires for the last 200 crankshaft revolution sample period.
Traction Control Axle Torque Request Signal	N•m (lb ft)	This parameter indicates the axle torque requested by the traction control module.
Traction Control Status	Inactive	This parameter displays Active if the electronic brake and traction control module (EBTCM) is commanding traction control.
Transmission Fluid Pressure Accumulator Solenoid Valve Command	On/Off	This parameter displays the position of the Transmission Fluid Pressure Accumulator Solenoid Valve Control.

Parameter	Value	Description
Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is shorted to voltage.
Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is shorted to ground.
Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit Open Test Status	OK / Okay, Malfunction, Not Run	This parameter displays the state of the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit. The parameter displays Malfunction if the Transmission Fluid Pressure Accumulator Solenoid Valve Control Circuit is open.
Transmission Fluid Temperature Sensor	°C (°F)	This parameter displays the undefaulted, unfiltered transmission oil / fluid temperature measured by a sensor.
Turbocharger 1 Turbine Inlet Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the turbocharger 1 turbine inlet valve control circuit. The parameter displays Malfunction if the turbocharger 1 turbine inlet valve control circuit is shorted to voltage.
Turbocharger 1 Turbine Inlet Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the turbocharger 1 turbine inlet valve control circuit. The parameter displays Malfunction if the turbocharger 1 turbine inlet valve control circuit is open.
Turbocharger 1 Turbine Inlet Valve Duty Cycle	%	This parameter displays the commanded duty cycle for the turbocharger 1 turbine inlet valve in a percentage.
Turbocharger Bypass Solenoid Valve Command	%	This parameter displays the commanded duty cycle for the turbocharger bypass solenoid valve in a percentage.
Turbocharger Bypass Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is shorted to voltage.
Turbocharger Bypass Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is shorted to ground.
Turbocharger Bypass Solenoid Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is open.
Turbocharger Wastegate Solenoid Valve Command	%	This parameter displays the commanded duty cycle for the turbocharger wastegate solenoid valve in a percentage.
Turbocharger Wastegate Solenoid Valve Control Circuit High Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the turbocharger wastegate solenoid valve control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is shorted to voltage.
Turbocharger Wastegate Solenoid Valve Control Circuit Low Voltage Test Status	OK / Okay , Malfunction	This parameter displays the state of the turbocharger wastegate solenoid valve control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is shorted to ground.
Turbocharger Wastegate Solenoid Valve Control Circuit Open Test Status	OK / Okay , Malfunction	This parameter displays the state of the turbocharger wastegate solenoid valve control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is open.
Upshift Indicator Command	Off	This parameter displays On when commanded by the engine control module.
Variable Valve Lift Low Lift Disable History 1–8	Varies	This parameter displays the reason for the last 8 variable valve lift disable history reasons.

Parameter	Value	Description
Variable Valve Lift Low Lift Inhibit – Reason	Varies	This parameter lists the reason the variable valve lift low lift may be inhibited. These include; 4WD Low State Invalid, A/C Compressor Clutch On, Acceleration Request, Brake Booster Pressure Sensor DTC, Brake Booster Weak Vacuum, Calculated Torque, Camshaft Position Sensor DTC, Control Function Active, Crankshaft Position Sensor DTC, ECT, ECT Sensor DTC, Engine Controls Ignition Relay DTC, Engine Not Synchronized, Engine Off, Engine Oil Pressure, Engine Oil Pressure Control Solenoid Valve Stuck Off, Engine Oil Pressure Control Test Active, Engine Oil Pressure Sensor DTC, Engine Oil Temperature, Engine Overtemperature Protection, Engine Power Not Requested, Engine Speed, Engine Torque Capacity, Fuel Alcohol Content Learn In Progress, Fuel Alcohol Content Too High, Fuel System Disabled, Green Engine Mode, HO2S 2 Test, Hot Coolant Mode, Hybrid/EV Powertrain Control Module Request, IAT Sensor DTC, Ignition Voltage, MAP Sensor DTC, Maximum Throttle Exceeded, Minimum Time After TAC DTC, Misfire DTC, Oil Aeration. On-Board Diagnostic System, Rocker Arm Solenoid Valve DTC, RPM Limit, TAC System DTC, Transmission Gear, Transmission Range, Transmission Shifting, Vehicle Speed Too Low, VSS DTC.
Variable Valve Lift System Command	Low Lift	This parameter displays the current state of the variable valve lift system command.
Vehicle Speed Sensor	Km/h mph	This parameter displays the speed of the vehicle as calculated by the transmission control module (TCM) from information received from the vehicle speed sensor (VSS).
Vehicle Speed When Engine Overspeed Detected	Km/h mph	This parameter displays the Vehicle Speed When Engine Overspeed Detected.
VIN Programming Counter	Counts	This parameter displays the number of times the VIN has been programmed. This counter can only be incremented.
Warm Ups Since DTC Cleared	Counts	This parameter indicates the number of warm up cycles that have occurred Since DTCs were cleared. The scan tool will display a higher counts as more warm up cycles have occurred since the DTCs were cleared.
Warm Ups without Emission Malfunctions	Counts	This parameter displays the number of OBD defined warm up cycles since the last emissions related (fault type A or B) fail report or MIL request. Emissions related DTCs are cleared from memory when this counter reaches 40.
Warm Ups without Non Emission Malfunctions	Counts	This parameter displays the number of OBD defined warm up cycles since the last non emissions related (fault type C) fail report. Non emissions related DTCs are cleared from memory when this counter reaches 40.
Weight Percent Water in Air	%	This parameter displays the calculated value of weight per cent water (specific humidity) in the intake air.
Wide Open Throttle	No	This parameter displays the throttle status commanded by the control module. The scan tool will display Yes if the vehicle throttle is commanded to 100 percent.
Wide Open Throttle	No	This parameter displays the desired throttle position exceeds a WOT threshold (selected specifically for service).

Engine Control Module (ECM) Scan Tool Output Controls

Output Control	Description
This is a comprehensive list. Not all output controls listed are available for all applications.	
A/C Compressor Clutch Relay	This device control is used to override the state of the air conditioning compressor output.
Active Grill Air Shutter 1 or 2 Commanded Position	This device control is used to command the position of the active grill air shutter 1 or 2 output. 0% equals fully closed, 100% equals fully open.

Output Control	Description
Alternative Fuel High Pressure Shutoff Valve Control	This device control is used to override the state of the alternative fuel shutoff valve 1 output.
Alternative Fuel Injector Disable Control	This device control is used with the engine running to override the state of the alternative fuel injector outputs. This device control is used to disable alternative fuel injectors in order to cut off alternative fuel to the associated cylinders.
Alternative Fuel Injector Flow Control	This device control is used to trigger a single Alternative fuel injector to be commanded on for a calibrated number of pulses (e.g. 25) in order to test the flow of the Alternative fuel injector.
Alternative Fuel Low Pressure Shutoff Valve Control	This device control is used to verify functionality of the Alternative Fuel Low Pressure Fuel Shutoff Valve system by allowing the Alternative Fuel Low Pressure Fuel Shutoff Valve output to be commanded to a specific Alternative Fuel Rail Pressure.
Alternative Fuel System Leak Test – Service Bay Test	This device control will signal the ECM to begin the Alternative Fuel System Leak Test.
Autostop/Autostart	This device control is used to override the internal combustion engine (ICE) running state.
BiFuel System – Fuel Mode Selection	When this CPID is active, the fuel mode is commanded to the selection made in “Fuel Mode Selection.”
Brake Pedal Position Learn	This device control is used to reset the brake pedal fully released learned position to its initialized value after a brake system repair.
Camshaft Profile Actuator Stuck On Reset	This device control is used to reset a latched default action when the camshaft profile actuator control is stuck on. The device control will work in conjunction with the vehicle diagnostics to ensure a proper system check before allowing normal vehicle operation.
Camshaft Profile Actuator System	This device control is used to override the state
Compression Test	This device control is used to set up the internal combustion engine for a compression test. The fuel pump, fuel injectors, and spark are all disabled. The throttle is opened to a Wide Open Throttle (WOT) position. For conventional engine vehicles, the extended crank feature is not active, and for strong hybrid vehicles, the Hybrid Powertrain Control Module is configured to crank at the speed specified in the device control command. Engine cranking is completely controlled by the technician either through the ignition key or through a remote starter switch as applicable. The device control limits and rejects will apply normally upon entry to the device control. Once the device control is active, the limits will be monitored (to prevent unwanted starter operation, for example), but in the case of a limit exceeded or a tester disconnect, device control of the fuel and spark will not be released until the Power Mode switches to Accessory or OFF. This will prevent unexpected fuel and spark operation in the case of a device control abort.
Coolant Fill	This device control is used to start an automatic coolant fill service routine that will ensure proper fill and de-aeration of the cooling system.
Cooling Fan Relay 1	This function activates the cooling fan relay 1. The normal commanded state of the fan relay is NONE. The relay command status can also be monitored on the scan tool data parameter Cooling Fan Relay 1 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F).
Cooling Fan Relay 1,2 and 3	This function activates the cooling fan relay 1, 2 and 3. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameters Cooling Fan Relay 1 Command and Cooling Fan Relays 2 and 3 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F).
Cooling Fan 2 and 3	This function activates the cooling fan relay 2 and relay 3. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameter 2 and 3 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F).

Output Control	Description
Crankshaft Position Variation Learn	This device control is used to activate the crankshaft position variation learn algorithm which calculates the reference pulse correction factors for the misfire diagnostic.
Cylinder Power Balance	**Note:** The Misfire Current and Misfire History parameters may not increment when using this function. This function disables the selected fuel injector. The normal commanded state is None. The scan tool initiates the test when the following conditions are met: • The engine is operating and the engine idle is stable. • The vehicle speed is 0 km/h (0 mph). • There are no DTCs set for the vehicle speed sensor. If the fuel injector was disabled for 30 seconds, fuel injector control is not allowed again on the same fuel injector for 60 seconds.
Cylinder 1–4 Exhaust Camshaft Profile Sleeve	This device control is used to override the state. In order to command Deactivate on the B camshaft, the A camshaft profile for the same cylinder must be commanded to Deactivate.
Cylinder 1–4 Intake Camshaft Profile Sleeve	This device control is used to override the state. Upon return to normal control, the system shall actuate the camshaft profile control sleeve as necessary to the system desired position.
Depressurize Fuel System	When the low pressure fuel pump is used in conjunction with a separate high pressure fuel pump for Direct Injection (DI) engines, this device control can be used to reduce the high fuel pressure to a low working level. The high fuel pressure control shall monitor the low pressure “Fuel Pump Device Control with Engine Running” such that when the low pressure pump is commanded OFF the high pressure pump will be controlled to a low pressure value. This combination shall be held until either the FPMR device control is released, or the engine stalls.
Engine Controls Ignition Relay	This device control is used to override the state of the Powertrain Relay.
Engine Coolant Thermostat Heater	This device control is used to override the state of the Engine Coolant Thermostat Heater.
Engine Oil Life Reset	This DID contains the engine oil remaining life determined from an algorithm based upon the effective engine revolutions and the distance driven since the last oil change. This DID may be used to reset the engine oil remaining life to 100 % after an oil change or to any other value when replacing a control module.
Engine Oil Pressure Control Solenoid Valve	This device control is used to override the state of the variable displacement oil pump. When the variable displacement oil pump is turned on, the oil pump will be commanded to a low pressure state.
Engine Speed	This function controls the idle speed override in 25 RPM, 100 RPM, and 500 RPM increments, from the base idle speed to 1,400 RPM. The scan tool initiates the test when the following conditions are met: • The transmission is in park or neutral. • The engine speed is less than 1,000 RPM. The engine speed will remain in the commanded state until cancelled by the scan tool.
EVAP Purge/Seal	**Note:** The EVAP Purge and Vent Solenoid Command parameters may not change states when using this output control. This function activates both the EVAP purge solenoid valve and EVAP vent solenoid to seal the EVAP system. When activated, the purge valve is commanded to 0 percent and the vent valve is commanded ON, Not-venting. The normal commanded state for both solenoids is None. Both of the solenoids remain in the commanded state until cancelled by the scan tool or the FTP sensor exceeds −24 mm Hg (−12 inch H20).
EVAP Purge Solenoid Valve	**Note:** The EVAP Purge Solenoid Command parameter may not change states when using this output control. This function controls the evaporative emission (EVAP) purge solenoid valve. The normal commanded state is NONE. The system will increase or decrease the amount of purge by changing the duty cycle of the purge valve in 10 percent increments within a range of 0–100 percent. The system remains in the commanded state until cancelled by the scan tool or the fuel tank pressure (FTP) sensor exceeds −24 mm Hg (−12 inch H20).
EVAP Test	This device control is used to activate the evaporative emissions service bay test.

Output Control	Description
EVAP Vent Solenoid Valve	**Note:** The EVAP Vent Solenoid Command parameter may not change states when using this output control. This function controls the EVAP vent solenoid. The normal commanded state is NONE. When commanded ON, the vent valve switches to Not-venting. The system remains in the commanded state unless one of the following conditions occur: • Cancelled by the scan tool • The EVAP canister purge solenoid is more than 0 percent, and the FTP sensor exceeds −24 mm Hg (−12 inch H20).
Excessive Clutch Slip Data Reset	This device control is used to reset all clutch slip detection values.
Exhaust Camshaft Position Actuator or Exhaust Camshaft Position Actuator Bank 1	This device control is used to override the state of the exhaust cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position).
Exhaust Camshaft Position Actuator or Exhaust Camshaft Position Actuator Bank 2	This device control is used to override the state of the exhaust cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position).
Exhaust Camshaft Position Actuator Solenoid Valve or Exhaust Camshaft Position Actuator Solenoid Valve Bank 1	This device control is used to override the state of the exhaust cam phase solenoid output.
Exhaust Camshaft Position Actuator Solenoid Valve or Exhaust Camshaft Position Actuator Solenoid Valve Bank 2	This device control is used to override the state of the exhaust cam phase solenoid output.
Exhaust Camshaft Profile Actuator	This device control is used to override the state of the B camshaft profile actuator control outputs. The device control is intended as an electrical test and is only allowed with the actuator connector disconnected. This is confirmed by having the open circuit fault active for the camshaft profile actuator position sensor and at least one of the two camshaft profile actuator control outputs on the actuator assembly the device control is being requested for.
Fuel Composition Reset	**Note:** Do not use this output control unless the actual alcohol content of the fuel in the tank is 10 percent or less. This will reset the learned alcohol composition to 0 percent in the engine control module (ECM).
Fuel Control Loop Status	This function controls the heated oxygen sensor (HO2S) loop status. The commanded states include NONE, OPEN, and CLOSED. The normal commanded state is NONE. The loop status changes as commanded, OPEN or CLOSED. The system remains in the commanded state until cancelled by the scan tool.
Fuel Injector Balance Test (If Available)	This function enables the fuel injector in order to verify the correct fuel injector flow. The ECM will pulse the selected fuel injector when the following conditions are met: • All instruction on the scan tool is complete. • A fuel injector is selected. • The ignition is ON with the engine OFF. The selected fuel injector can only be flowed/pulsed once per ignition cycle.
Fuel Mode Indicator Lamp System	This device control is used to verify the functionality of the Fuel Mode Indicator Lamp.

Output Control	Description
Fuel Pressure	This function allows control of the fuel rail pressure (FRP) regulator which is integral to the high pressure fuel pump. The system will Increase or Decrease the fuel rail pressure in increments, as commanded within an approximate range of 1862–17,237 kPa (270–2500 psi). The scan tool initiates the test when the following conditions are met: • The engine is operating • The ignition voltage is 10–18 V • The vehicle speed is 0 mph • DTC P0700 is not set The system remains in the commanded state for about 30 seconds or until cancelled by the scan tool or the ECM detects a vehicle speed.
Fuel Pressure Regulator	**Note:** As this is an electrical circuit test, a regulator solenoid commanded to ON does not necessarily equate to the regulator state at maximum fuel pressure. This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to activate the fuel pressure regulator at ignition ON, engine OFF. Both the low side and high side of the regulator are controlled together. Commanding the regulator to ON will modulate the high side driver to a calibratible Maximum Duty Cycle.
Fuel Pump Enable	This function controls the fuel pump. The normal commanded state is NONE. The scan tool initiates the test when the following conditions are met: • There are no vehicle speed sensor DTCs set. • The vehicle speed is 0 km/h (0 mph). When commanded ON/OFF, the engine control module (ECM) turns the fuel pump ON/OFF. If the engine is running and the fuel pump is commanded OFF, the engine will stall. The system remains in the commanded state for about 2 seconds or until cancelled by the scan tool or the ECM detects a vehicle speed.
Fuel Pump Speed	This device control is used to override the normal control of the fuel pump output. The device control is a service diagnostic aid that is used to determine if the fuel pump system is functioning properly. Different limit checks are used when the engine is and is not running for the operation of the fuel pump.
Fuel Rail Pressure	This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to override the commanded fuel high pressure output from the powertrain controller.
Fuel Trim Enable	This function disables the control modules ability to learn new fuel trim parameters. The commanded states are NONE, ENABLED, DISABLED. The normal commanded state is NONE. The system remains in the commanded state until cancelled by the scan tool.
Fuel Trim Reset	This function is used to reset the learned fuel trim values to their initial values.
Generator L-Terminal	Commands the generator L terminal ON and OFF.
Heater Coolant Pump	This device control is used to override the state of the heater core pump relay output.
HO2S Heater Sensor 1 or HO2S Heater Bank 1 Sensor 1	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Sensor 2 or HO2S Heater Bank 1 Sensor 2	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Bank 2 Sensor 1	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.

Output Control	Description
HO2S Heater Bank 2 Sensor 2	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Learn	This device control is used to trigger the reset of the learned resistances for the oxygen sensor heaters following a replacement in service. The learned resistances are reset to a calibration used to prevent overheating of the sensors until more accurate resistances may be learned following an extended engine OFF time (typically 12 or more hours).
Idle Ignition Timing	Disables and enables idle spark advance with the engine running.
Idle Learn	This function allows the throttle position and the idle speed to be relearned by the ECM, once the following conditions have been met. • The ignition is ON with the engine OFF. • The ECT is between 5–85°C (41–185°F). • No throttle actuator control (TAC) system DTCs are set.
Ignition Timing Retard	This device control is used to retard the spark angle from the software calculated spark angle. For example, if the software calculated spark angle was 15 degrees advanced and this device control requested a 3 degree retard, the commanded spark angle that would be delivered would be 12 degrees advanced.
Intake Air Heater	This device control is used to override the state of the intake air heater.
Intake Camshaft Position Actuator or Intake Camshaft Position Actuator Bank 1	This device control is used to override the state of the intake cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (advance for intake camshafts) from the park position (a camshaft position of zero represents the park position).
Intake Camshaft Position Actuator or Intake Camshaft Position Actuator Bank 2	This device control is used to override the state of the intake cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (advance for intake camshafts) from the park position (a camshaft position of zero represents the park position).
Intake Camshaft Position Actuator Solenoid Valve or Intake Camshaft Position Actuator Solenoid Valve Bank 1	This device control is used to override the state of the intake cam phase solenoid output.
Intake Camshaft Position Actuator Solenoid Valve or Intake Camshaft Position Actuator Solenoid Valve Bank 2	This device control is used to override the state of the intake cam phase solenoid output.
Intake Camshaft Profile Actuator	This device control is used to override the state of the A camshaft profile actuator control outputs. The device control is intended as an electrical test and is only allowed with the actuator connector disconnected. This is confirmed by having the open circuit fault active for the camshaft profile actuator position sensor and at least one of the two camshaft profile actuator control outputs on the actuator assembly the device control is being requested for.
Intake Rocker Arm Solenoid Valve 1–2 or 1 and 2	When the engine is running, this device control may be used to command intake valve opening to low or high (high being default when the solenoid is not energized) valve lift mode either in cylinder pairs or as a system.
Malfunction Indicator Lamp (MIL)	This function controls the malfunction indicator lamp (MIL). The normal commanded state is NONE. When commanded ON/OFF, the ECM turns the MIL ON/OFF. The system remains in the commanded state until cancelled by the scan tool.
Mass Air Flow Sensor Supply Voltage	This device control is used to override the state of the mass air flow sensor supply voltage output.
Misfire Graphic	This function clears the misfire graphics from the scan tool.
Oil Life Reset	This output control is used to reset the engine oil life monitor from 0 to 100 %.

Output Control	Description
Remote Vehicle Start Disable History Reset	This function clears the remote vehicle start (RVS) disable history. When RESET is selected the reason the control module did not allow RVS in the last 8 attempts is cleared.
Secondary Air Injection Pump Relay	This device control is used to turn the AIR Pump ON or OFF.
Secondary Air Injection Solenoid Valve	This device control is used to turn the AIR Valve ON or OFF.
Secondary Air Injection Test	This device control is used to trigger the secondary air injection (SAI) diagnostic service bay test, which causes the on board SAI diagnostic to execute until it is completed or aborted.
Starter Relay (If Available)	Commands the starter relay ON and OFF.
Throttle Position	This device control is used to override the commanded throttle position.
Throttle Sweep	This function moves the Throttle plate slowly from a closed position to wide open position, aiding diagnosis of TAC motor.
Transmission Fluid Pressure Accumulator Solenoid Valve	This device control is used to override the state of the Transmission Fluid Pressure Accumulator Solenoid Valve.
Turbocharger Bypass Solenoid Valve	This device control is used to control the duty cycle for the turbocharger A compressor bypass.
Turbocharger Wastegate Solenoid Valve	This device control is used to control the duty cycle for the turbocharger A wastegate.

K219 Lighting Control Module: Scan Tool Information

Lighting Control Module — Data Display — Front Exterior Lighting Data

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Left Daytime Running Lamps	—	Off	The scan tool displays On or Off.
Right Daytime Running Lamps	—	Off	The scan tool displays On or Off.
Left Low Beam Command	—	Inactive	The scan tool displays Active or Inactive.
Right Low Beam Command	—	Inactive	The scan tool displays Active or Inactive.
Left Front Turn Signal Lamp Command	—	Off	The scan tool displays On or Off.
Right Front Turn Signal Lamp Command	—	Off	The scan tool displays On or Off.
Left Park Lamps Command	—	Off	The scan tool displays On or Off.
Right Park Lamps Command	—	Off	The scan tool displays On or Off.

Lighting Control Module — Data Display — Rear Exterior Lighting Data

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Left Turn Signal Lamps	—	Off	The scan tool displays On or Off.
Right Turn Signal Lamps	—	Off	The scan tool displays On or Off.
Left Tail Lamp Driver	—	Off	The scan tool displays On or Off.

Parameter	System State	Expected Value	Description
Right Tail Lamp Driver	—	Off	The scan tool displays On or Off.
Center High Mounted Stop Lamp Driver	—	Off	The scan tool displays On or Off.
License Plate Lamp Circuit Driver	—	Off	The scan tool displays On or Off.

Lighting Control Module — Data Display — Side Exterior Lighting Data

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Left Side Marker Lamp Command	—	Off	The scan tool displays On or Off.
Right Side Marker Lamp Command	—	Off	The scan tool displays On or Off.
Left Turn Signal Repeater Lamp Command	—	Off	The scan tool displays On or Off.
Right Turn Signal Repeater Lamp Command	—	Off	The scan tool displays On or Off.

Lighting Control Module — Data Display — Indicator Data

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Vehicle in Service Mode, Vehicle in Park, All Doors Closed			
Daytime Running Lamps Indicator	—	Off	The scan tool displays On or Off.
Front Park Lamps Indicator	—	Off	The scan tool displays On or Off.
Headlamp High Beam Indicator	—	Inactive	The scan tool displays Active or Inactive.
Left Turn Signal Indicator	—	Off	The scan tool displays On or Off.
Right Turn Signal Indicator	—	Off	The scan tool displays On or Off.
Left Front Turn Signal Lamp Malfunction Indicator	—	Off	The scan tool displays On or Off.
Left Rear Turn Signal Lamp Malfunction Indicator	—	Off	The scan tool displays On or Off.
Right Front Turn Signal Lamp Malfunction Indicator	—	Off	The scan tool displays On or Off.
Right Rear Turn Signal Lamp Malfunction Indicator	—	Off	The scan tool displays On or Off.

Lighting Control Module — Exterior Lighting — Scan Tool Output Controls

Output Control	Description
Center High Mounted Stop Lamp	This output control is used to activate the center high mounted stop lamp when selecting On. The center high mounted stop lamp should illuminate until commanded Off.
Left Stop Lamp	This output control is used to activate the left stop lamp when selecting On. The left stop lamp should illuminate until commanded Off.
Right Stop Lamp	This output control is used to activate the right stop lamp when selecting On. The right stop lamp should illuminate until commanded Off.

Output Control	Description
License Plate Lamps	This output control is used to activate the license plate lamps when selecting On. The license plate lamps should illuminate until commanded Off.
Backup Lamps	This output control is used to activate the backup lamps when selecting On. The backup lamps should illuminate until commanded Off.
Left Front Park Lamp Status	This output control is used to activate the left park lamps when selecting On. The left park lamps should illuminate until commanded Off.
Right Front Park Lamp Status	This output control is used to activate the right park lamps when selecting On. The right park lamps should illuminate until commanded Off.
Left Daytime Running Lamps	This output control is used to activate the left daytime running lamps when selecting On. The left daytime running lamps should illuminate until commanded Off.
Right Daytime Running Lamps	This output control is used to activate the right daytime running lamps when selecting On. The right daytime running lamps should illuminate until commanded Off.
Left Auxiliary Daytime Running Lamps	This output control is used to activate the left auxiliary daytime running lamps when selecting On. The left auxiliary daytime running lamps should illuminate until commanded Off.
Right Auxiliary Daytime Running Lamps	This output control is used to activate the right auxiliary daytime running lamps when selecting On. The right auxiliary daytime running lamps should illuminate until commanded Off.
Left Front Auxiliary Park Lamp Command	This output control is used to activate the left front auxiliary park lamp when selecting On. The left front auxiliary park lamp should illuminate until commanded Off.
Right Front Auxiliary Park Lamp Command	This output control is used to activate the right front auxiliary park lamp when selecting On. The right front auxiliary park lamp should illuminate until commanded Off.
Left Front Turn Signal Lamp Command	This output control is used to activate the left front turn signal lamp when selecting On. The left front turn signal lamp should illuminate until commanded Off.
Right Front Turn Signal Lamp Command	This output control is used to activate the right front turn signal lamp when selecting On. The right front turn signal lamp should illuminate until commanded Off.
Left Turn Signal Repeater Lamp Command	This output control is used to activate the left turn signal repeater lamp when selecting On. The left turn signal repeater lamp should illuminate until commanded Off.
Right Turn Signal Repeater Lamp Command	This output control is used to activate the right turn signal repeater lamp when selecting On. The right turn signal repeater lamp should illuminate until commanded Off.
Left Rear Turn Signal Lamp	This output control is used to activate the left rear turn signal lamp when selecting On. The left rear turn signal lamp should illuminate until commanded Off.
Right Rear Turn Signal Lamp	This output control is used to activate the right rear turn signal lamp when selecting On. The right rear turn signal lamp should illuminate until commanded Off.

K234 Rear Seat Heater Vent Control Module: Scan Tool Information

Rear Seat Heating Control Module Scan Tool Data Display Parameters

Parameter	Expected Value	Description
Operating Conditions: Engine Running		
Left Rear Seat Cushion Heating Command	Inactive	The scan tool displays Inactive or Active. This parameter displays the commanded output from the seat heating control module to the seat heater elements.
Left Rear Seat Cushion Temperature Sensor	Varies	The scan tool displays 0 – 5 V. The voltage displayed is an input to the seat heating control module from the seat cushion temperature sensor. Higher voltage readings indicate cooler seat temperatures while lower voltage readings indicate warmer seat temperatures.
Left Rear Seat Heating/Venting/ Cooling Level	Off	The scan tool displays Off, High Medium, or Low. When the heated seat is active, this parameter displays the selected temperature setting.
Left Rear Seat Heating/Venting/ Cooling Mode	Off	The scan tool displays Off or Back & Cushion Heat. This parameter indicates the heated seat mode of operation.

Parameter	Expected Value	Description
Right Rear Seat Cushion Heating Command	Inactive	The scan tool displays Inactive or Active. This parameter displays the commanded output from the seat heating control module to the seat heater elements.
Right Rear Seat Cushion Temperature Sensor	Varies	The scan tool displays 0 – 5 V. The voltage displayed is an input to the seat heating control module from the seat cushion temperature sensor. Higher voltage readings indicate cooler seat temperatures while lower voltage readings indicate warmer seat temperatures.
Right Rear Seat Heating/Venting/ Cooling Level	Off	The scan tool displays Off, High Medium, or Low. When the heated seat is active, this parameter displays the selected temperature setting.
Right Rear Seat Heating/Venting/ Cooling Mode	Off	The scan tool displays Off or Back & Cushion Heat. This parameter indicates the heated seat mode of operation.

Rear Seat Heating Control Module Scan Tool Control Functions

Control Functions	Description
Operating Conditions: Engine Running	
Left Rear Seat Cushion Heating	This output control is used to command the left rear seat heater element On.
Right Rear Seat Cushion Heating	This output control is used to command the right rear seat heater element On.

K29FV Front Seat Heater Vent Control Module: Scan Tool Information

Front Seat Heating Control Module Scan Tool Data Parameters

Parameter	Expected Values	Description
Operating Conditions: Engine Running		
Seat Heating/Venting/Cooling Load Shed	Inactive / Active	When this parameter is active it indicates the Heating/Venting/ System is shutdown to reduce strain on the vehicle electrical system which is experiencing too high of a current draw
Left Front Seat Heating/Venting/ Cooling Operating Conditions	Remote Vehicle Start / Automatic / Manual / Autostop Request	The functional behavior of heated seats is dependent on its determined operational state. This parameter indicates the defined state which it is operating in.
Left Front Seat Heating/Venting/ Cooling Switch	Inactive / Active	The Heated/Vented switch assembly contains a number of switches affecting the operation of the Heated Vented Seats. This parameter indicates when any one of the switches is active and is persistent as long as the switch is pressed.
Left Front Seat Heating/Venting/ Cooling Requested Mode	Off / Seat Back Heating / Seat Back and Cushion Heating / Seat Venting/ Cooling	This parameter indicates the type of Heated/Vented Seat function being requested , as determined by the BCM tracking various inputs
Left Front Seat Heating/Venting/ Cooling Requested Level	Off / High / Medium / Low	This parameter indicates the type of Heated/Vented Seat level of intensity being requested as determined by the BCM tracking various inputs
Left Front Seat Heating/Venting/ Cooling Mode	Off / Seat Back Heating / Seat Back and Cushion Heating / Seat Venting/ Cooling	This parameter indicates the type of Heated/Vented Seat function being applied as commanded by the BCM software based on a number of factors
Left Front Seat Heating/Venting/ Cooling Level	Off / High / Medium / Low	This parameter indicates the type of Heated/Vented Seat level of intensity being applied as commanded by the BCM software based on a number of factors.
Right Front Seat Heating/Venting/ Cooling Operating Conditions	Remote Vehicle Start / Automatic / Manual / Autostop Request	The functional behavior of heated seats is dependent on its determined operational state. This parameter indicates the defined state which it is operating in.
Right Front Seat Heating/Venting/ Cooling Switch	Inactive / Active	The Heated/Vented switch assembly contains a number of switches affecting the operation of the Heated Vented Seats. This parameter indicates when any one of the switches is active and is persistent as long as the switch is pressed.

Parameter	Expected Values	Description
Right Front Seat Heating/Venting/ Cooling Requested Mode	Off / Seat Back Heating / Seat Back and Cushion Heating / Seat Venting/ Cooling	This parameter indicates the type of Heated/Vented Seat function being requested, as determined by the BCM tracking various inputs
Right Front Seat Heating/Venting/ Cooling Requested Level	Off / High / Medium / Low	This parameter indicates the type of Heated/Vented Seat level of intensity being requested as determined by the BCM tracking various inputs
Right Front Seat Heating/Venting/ Cooling Mode	Off / Seat Back Heating / Seat Back and Cushion Heating / Seat Venting/ Cooling	This parameter indicates the type of Heated/Vented Seat function being applied as commanded by the BCM software based on a number of factors
Right Front Seat Heating/Venting/ Cooling Level	Off / High / Medium / Low	This parameter indicates the type of Heated/Vented Seat level of intensity being applied as commanded by the BCM software based on a number of factors.

Front Seat Heating Control Module Scan Tool Output Controls

Control Functions	Description
Operating Conditions: Engine Running	
Left Front Seat Heating	This output control is used to command the left front seat heater elements On.
Right Front Seat Heating	This output control is used to command the right front seat heater elements On.
Left Front Seat Blower Command	This output control is used to command the left front seat blower On.
Right Front Seat Blower Command	This output control is used to command the right front seat blower On.

K36 Restraints Control Module: Scan Tool Information

Note: Some parameters and values in the table below may not apply to every vehicle.

Restraints Control Module Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
2nd Row Left Seat Belt Reminder Sensor Pad Enable Status	Disabled/Enabled	The scan tool displays if the left rear seat belt reminder sensor pad is enabled to the RCM.
2nd Row Left Seat Belt Reminder Sensor Pad Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the left rear seat belt reminder sensor pad has been learned by the RCM.
2nd Row Left Seat Belt Status	Buckled/Unbuckled	The scan tool displays Buckled or Unbuckled. This is the state of the left rear seat belt switch when the seat belt is buckled or unbuckled.
2nd Row Middle Seat Belt Reminder Sensor Pad Enable Status	Disabled/Enabled	The scan tool displays if the rear middle seat belt reminder sensor pad is enabled to the RCM.
2nd Row Middle Seat Belt Reminder Sensor Pad Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the rear middle seat belt reminder sensor pad has been learned by the RCM.
2nd Row Middle Seat Belt Status	Buckled/Unbuckled	The scan tool displays Buckled or Unbuckled. This is the state of the middle rear seat belt switch when the seat belt is buckled or unbuckled.
2nd Row Middle Seat Belt Reminder Sensor Pad Enable Status	Disabled/Enabled	The scan tool displays if the rear right seat belt reminder sensor pad is enabled to the RCM.

Parameter	Expected Value	Definition
2nd Row Middle Seat Belt Reminder Sensor Pad Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the rear right seat belt reminder sensor pad has been learned by the RCM.
2nd Row Right Seat Belt Status	Buckled/Unbuckled	The scan tool displays Buckled or Unbuckled. This is the state of the right rear seat belt switch when the seat belt is buckled or unbuckled.
Air Bag Malfunction Indicator	On/Off/Flashes	The scan tool will display On or Flashes if there is a problem with the SIR system. Any problems within the SIR system will illuminate the air bag indicator. The indicator will either flash or stay on.
Base Model Part Number	Varies, 8 Digit Number	The scan tool displays the part number of the RCM which is stored in non volatile memory.
Calibration Part Number	Varies, 8 Digit Number	The scan tool displays the part number of the calibration file in the RCM.
Deployment Loop 1-18 Enable Status	Enabled/Disabled	The scan tool displays Enabled or Disabled. This is the status of the air bag or pretensioner.
Deployment Loop 1-18 Learn Status	Learned/Not Learned	The scan tool displays Learned or Not learned. Learned is displayed if the RCM has defined the number loop programmed from an air bag or pretensioner.
Deployment Loop 1-18 Resistance	1.44–4.25 Ohms	The scan tool displays the resistance of the learned loop of the air bag or pretensioner when connected to the RCM.
Deployment Loop 1-18 Type	Varies	The scan tool displays the name of the air bag or pretensioner associated with the loop type 1–18.
Driver Seat Belt Reminder Indicator	On/Off	The scan tool displays On if this indicator is on. If the indicator is on it means the seat belt has not been buckled.
Driver Seat Belt Sensor Enable Status	Enabled/Disabled	The scan tool displays if the seat belt sensor in the seat belt buckle is enabled to the RCM.
Driver Seat Belt Sensor Learn Status	Learned/Not learned	The scan tool displays Learned or Not Learned. Learned is displayed if the driver seat belt sensor has been learned by the RCM.
Driver Seat Belt Status	Buckled/Unbuckled	The scan tool displays Buckled or Unbuckled. This is the state of the driver seat belt switch when the seat belt is buckled or unbuckled.
Driver Seat Position Sensor	Rearward/Forward	The scan tool will display if the driver seat is forward or rearward of the sensor set position.
Driver Seat Position Sensor Enable Status	Enabled/Disabled	The scan tool displays if the seat position sensor is enabled to the RCM.
Driver Seat Position Sensor Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the driver seat position sensor has been learned by the RCM.
End Model Part Number	Varies, 8 Digit Number	The scan tool displays the part number of the RCM in production.
Impact Sensor 1-8 Enable Status	Enabled/Disabled	The scan tool displays Enabled or Disabled This is the status of the impact sensor.
Impact Sensor 1-8 Learn Status	Learned/Not Learned	The scan tool displays Learned or Not learned. Learned is displayed if the RCM has learned and has assigned a number to that impact sensor.
Impact Sensor 1-8 Type	Equipped/Not Equipped	The scan tool displays the name of the impact sensor associated with the type 1–8.
Restraint Control Module Module Primary Key	Hex Value	The scan tool indicates the primary key Hex value.
Manufacturer's Traceability Number	Varies, 16 Digit Number	The scan tool displays the 16 digit traceability number in the RCM.
Module Setup	Incomplete/Complete	The scan tool indicates if the RCM is set up.
Passenger Air Bag Disabled Switch	On/Off	The scan tool displays Off when the customer manually turns the passenger airbag off with this switch.

Parameter	Expected Value	Definition
Passenger Air Bag Off Indicator	On/Off	The scan tool displays Off when the passenger indicator is not illuminated. This indicator is off when the disable switch is in the off position or no one is sitting in the passenger seat.
Passenger Air Bag On Indicator	On/Off	The scan tool displays On when the passenger indicator is illuminated. This indicator is on when the disable switch is in the on position and someone is sitting in the passenger seat.
Passenger Air Bag Status	Enabled/Disabled	The scan tool displays if the passenger air bag is enabled to the RCM.
Passenger Air Bag Disable Indicator Enable Status	Enabled/Disabled	The scan tool displays if the passenger air bag disable indicator is enabled to the RCM.
Passenger Air Bag Disable Indicator Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the RCM has learned the status of the passenger air bag disable indicator.
Passenger Air Bag Disable Switch Enable Status	Enabled/Disabled	The scan tool displays if the passenger air bag disable switch is enabled to the RCM.
Passenger Air Bag Disable Switch Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the RCM has learned the status of the passenger air bag disable switch.
Passenger Air Bag Enable Indicator Enable Status	Enabled/Disabled	The scan tool displays if the passenger air bag enable indicator is enabled to the RCM.
Passenger Air Bag Enable Indicator Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the RCM has learned the status of the passenger air bag enable indicator.
Passenger Classification	00–07	The scan tool will display what type of individual is sitting in the passenger seat.
Passenger Presence Detection System Enable Status	Enabled/Disabled	The scan tool displays if the restraint occupation classification system is enabled to the RCM.
Passenger Presence Detection System Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the RCM has learned the passenger presence system.
Passenger Presence Detection System Reporting DTC(s)	Yes/No	The RCM will report if there are DTCs set in the passenger presence module.
Passenger Seat Belt Reminder Indicator	On/Off	The scan tool displays On if this indicator is on. If the indicator is on it means the seat belt has not been buckled.
Passenger Seat Belt Reminder Indicator Enable Status	Disabled/Enabled	The scan tool displays if the passenger seat belt reminder indicator is enabled to the RCM.
Passenger Seat Belt Reminder Indicator Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt reminder indicator has been learned by the RCM.
Passenger Seat Belt Reminder Sensor Pad Enable Status	Disabled/Enabled	The scan tool displays if the passenger seat belt reminder sensor pad is enabled to the RCM.
Passenger Seat Belt Reminder Sensor Pad Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt reminder sensor pad has been learned by the RCM.
Passenger Seat Belt Sensor Enable Status	Enabled/Disabled	The scan tool displays if the seat position sensor is enabled to the RCM.
Passenger Seat Belt Sensor Learn Status	Learned/Not learned	The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat belt sensor has been learned by the RCM.
Passenger Seat Belt Status	Buckled/Unbuckled	The scan tool displays Buckled or Unbuckled. This is the state of the passenger seat belt switch when the seat belt is buckled or unbuckled.
Passenger Seat Occupancy Status	Empty Seat/Occupied	The scan tool displays Occupied if someone is sitting in the passenger seat.
Passenger Seat Position Sensor	Rearward/Forward	The scan tool will display if the passenger seat is forward or rearward of the sensor set position.

Parameter	Expected Value	Definition
Passenger Seat Position Sensor Enable Status	Disabled/Enabled	The scan tool displays if the passenger seat position sensor pad is enabled to the RCM.
Passenger Seat Position Sensor Learn Status	Learned/Not Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the passenger seat position sensor has been learned by the RCM.
Power Mode	Off/Accessory/Run/Crank Request	The scan tool will display the power mode of the vehicle.
Primary Key Status	Valid/Invalid	The scan tool displays Valid if the primary key matches what is stored to memory in the RCM.
Primary Key Status Last Ignition Cycle	Invalid/Valid	The RCM checks to see if the primary key data received is valid.
Received Primary Key	Hex Value	The scan tool displays a Hex value indicating the RCM received primary key data.
Rollover Sensor Enable Status	Disabled/Enabled	The scan tool displays if the rollover sensor is enabled to the RCM.
Rollover Sensor Learn Status	Learn/Unlearn	The scan tool displays Learned or Not Learned. Learned is displayed if the rollover sensor has been learned by the RCM.
Security Code Accepted	Yes/No	The RCM either accepts the security code or it does not. The scan tool displays Yes if the security code has been accepted by the RCM.
Security Code Lockout	Yes/No	The scan tool displays Yes if the RCM has been locked out because of the security code not being accepted.
Security Code Lockout Active Timer	Random Value	The RCM uses a timer before the security code is locked in the RCM.
Security Code Programmed	Yes/No	The scan tool displays Yes if the RCM has been programmed with the security code.
Security Code Programming Counter	Random Value	The RCM uses a counter for the value of the security code programming.
Security Code Reset Counter	Random Value	The RCM uses a counter to reset the value of the security code.
Software Part Number	Varies, 8 Digit Number	The scan tool displays the software part number in the RCM.
Vehicle Identification Number	Varies, 17 Digit Number	The VIN number of the vehicle programmed into the RCM.
VIN Programmed	Yes/No	The scan tool displays Yes if the VIN has been programmed into the RCM.
VIN Programming Counter	Random Value	The RCM uses this counter while programming the VIN.

K38A Chassis Control Module - Auxiliary: Scan Tool Information

Trailer Brake Controls Scan Tool Data List

Scan Tool Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition is ON, engine OFF, and vehicle is stationary			
ABS Active	—	No	The scan tool displays Yes/No. The scan tool displays No when ABS is not active.
Brake Apply Pressure Status	—	Valid	The scan tool displays Invalid or Valid. The scan tool displays Valid when the ignition is ON, and the brake apply sensor is not faulted.
Battery Voltage Signal	—	Varies	The scan tool displays 0–18 Volts. The scan tool displays approximately 12 Volts when the ignition is ON.
Brake Switch Status	—	Off	The scan tool displays On/Off. The scan tool indicates Off when the brake is not applied.

Scan Tool Parameter	System State	Expected Value	Definition
Electric Trailer Brakes Detected	—	No	The scan tool displays Yes or No. The scan tool displays Yes when the vehicle is connected to a trailer equipped with electric brakes.
HS Communication	—	Yes	The scan tool displays Yes or No.
Ignition Run/Crank	—	Active	The scan tool will display Active or Inactive. The scan tool will display Active when the signal received from the ECM Run/Crank position.
Master Cylinder Pressure Sensor Input	—	Varies	The scan tool will display brake fluid pressure. The scan tool will display kPa or psi signal received from the trailer brake control module.
Manual Apply Switch	—	Varies	The scan tool displays percent of manual apply lever travel. The scan tool displays 0–100%.
Manual Apply Switch 5 V Reference	—	Varies	The scan tool displays Volts. This is the reference voltage of the manual apply switch.
Manual Apply Switch	—	Varies	The scan tool displays Volts. This is the voltage of the manual apply lever.
Manual Apply Sw. Pos. Error	—	Varies	The scan tool displays percent of error between the manual apply and redundant manual apply signals. The scan tool displays 0–100%. A proper functioning switch should have a value less than 20 %
Redundant Manual Apply Sw.	—	Varies	The scan tool displays percent of manual apply lever travel using a redundant signal track. The scan tool displays 0–100%
Redundant Manual Apply Sw.	—	Varies	The scan tool displays volts. This is the voltage of the manual apply switch.
TBCM Diagnostic Fault	—	No	The scan tool will display Yes or No if a fault is detected. The scan tool will display the Yes if a fault signal is received from the trailer brake control module.
TBCM Relay Feedback	—	0	The scan tool displays a numeric value.
TBCM Relay Feedback Signal (unfiltered)	—	Varies	The scan tool displays Volts. This is the unfiltered feedback signal of the TBCM relay.
TBCM Relay Feedback Signal (filtered)	—	Varies	The scan tool displays Volts. This is the filtered feedback signal of the TBCM relay.
TBCM Relay Feedback Signal	—	Varies	The scan tool displays volts. This is the voltage of the relay feedback signal.
TBCM Cmd. Duty Cycle	—	Varies	The scan tool displays percent of battery voltage output commanded to the trailer brakes and depends on battery voltage and user gain setting. Approximately 100% will be indicated when user gain is set to 10.0 and the manual apply lever is fully applied with the engine running.
Trailer Brake Control	—	Disabled	The scan tool will display Enabled/ Disabled. The scan tool will display the signal received from the trailer brake control module.
Trailer Stop Lamp Signal	—	Off	The scan tool will display Not Requested or Off, Requested depending on the state of the brake switch, and manual apply lever. Requested will be displayed if the brake switch is active or On if the manual apply lever is applied.

Scan Tool Parameter	System State	Expected Value	Definition
Trailer Brake Relay Cmd.	—	12 Volts	The scan tool displays 0–18 Volts. The scan tool displays voltage commanded to the trailer brakes when a trailer with electric brakes is connected and depends on battery voltage and user gain setting. Approximately 12–14 volts will be indicated when user gain is set to 10.0 and the manual apply lever is fully applied with the engine running.
Trailer Brake Relay Status	—	Enabled	The scan tool will display Disabled or Enabled. Enabled will be displayed whenever there are no faults present in the trailer brake control module.
Trailer Connection Detected	—	No	The scan tool displays Yes or No. The scan tool displays Yes when a trailer with electric trailer brakes is connected.
Trailer Disconnect Detected	—	No	The scan tool will display Yes or No depending on the trailer connections. Yes will be displayed if a trailer connection is made to a trailer equipped with electric trailer brakes, and a disconnect occurs within the same ignition cycle.
User Gain Switch	—	Varies	The scan tool displays percent of full gain setting. The scan tool displays 0–100%. Each full gain setting represents an increment of approximately 10 percent of full gain setting. Approximately 40% will be indicated with a gain setting of 4.0, 65% will be indicated with a gain setting of 6.5, etc.
User Gain Switch	—	Varies	The scan tool displays volts. This is the voltage of the full gain setting.
User Gain Switch 5 V Reference	—	Varies	The scan tool displays volts. This is the reference voltage of the user gain switch.
Vehicle Speed	—	km/h or mph	The scan tool displays 0–327 km/h (0–204 mph). The scan tool displays 0 km/h (0 mph) when the vehicle is not moving or is moving at speeds less than or equal to 0 km/h (0 mph).

Scan Tool Parameters for Electronic Locking Differential (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature / Vehicle is in Park or Neutral			
5V Reference 1	—	Volts	The scan tool displays Volts. This is the Reference Voltage.
Differential Lock Switch Voltage	—	Volts	The scan tool displays Volts. This is the Front/Both Axle Differential Lock Switch.
Front Axle Differential Lock Actuator High Control Relay Feedback	—	Volts	The scan tool displays Volts. This is the Front Differential Lock Actuator High Side Feedback Voltage.
Front Axle Differential Lock Actuator Low Control Relay Feedback	—	Volts	The scan tool displays Volts. This is the Front Differential Lock Actuator Low Side Feedback Voltage.
Front Axle Differential Lock High Control Relay Command	—	On/Off	The scan tool displays On/Off. This is the state of the Front Axle Differential Lock.

Parameter	System State	Expected Value	Description
Front Axle Differential Lock Indicator Command	—	On/Off	The scan tool displays On/Off. This is the state of the Front/ Both Axle Differential Lock indicator.
Front Axle Differential Lock Low Control Relay Command	—	On/Off	The scan tool displays On/Off. This is the state of the Front Axle Differential Lock.
Front Axle Differential Lock Switch Status	—	On/Off	The scan tool displays On/Off. This is the state of the Front Axle Differential Lock Switch.
Front Axle Differential Status	—	Open/Locked Engaged/Disengaged	The scan tool displays varies states. This is the state of the Front Axle Differential Lock.
Ignition 1 Signal	—	Volts	The scan tool displays Volts. This is the state of voltage of power input to control module.
Rear Axle Differential Lock Actuator High Control Relay Feedback	—	Volts	The scan tool displays Volts. This is the Rear Differential Lock Actuator High Side Feedback Voltage.
Rear Axle Differential Lock Actuator Low Control Relay Feedback	—	Volts	The scan tool displays Volts. This is the Rear Differential Lock Actuator Low Side Feedback Voltage.
Rear Axle Differential Lock High Control Relay Command	—	On/Off	The scan tool displays On/Off. This is the state of the Rear Axle Differential Lock.
Rear Axle Differential Lock Indicator Command	—	On/Off	The scan tool displays On/Off. This is the state of the Rear Axle Differential Lock Indicator.
Rear Axle Differential Lock Low Control Relay Command	—	On/Off	The scan tool displays On/Off. This is the state of the Rear Axle Differential Lock.
Rear Axle Differential Lock Switch Status	—	On/Off	The scan tool displays On/Off. This is the state of the Rear Axle Differential Lock Switch.
Rear Axle Differential Status	—	Open/Locked Engaged/Disengaged	The scan tool displays varies states. This is the state of the Rear Axle Differential Lock.

Scan Tool Output Controls for Electronic Locking Differential (If Equipped)

Output Control	Description
Front Axle Differential Lock High Control Relay	This output control is used to turn the front axle differential lock high control relay on and off.
Front Axle Differential Lock Indicator	This output control is used to turn the front axle differential lock indicator on and off.
Front Axle Differential Lock Low Control Relay	This output control is used to turn the front axle differential lock low control relay on and off.
Rear Axle Differential Lock High Control Relay	This output control is used to turn the rear axle differential lock high control relay on and off.
Rear Axle Differential Lock Indicator	This output control is used to turn the rear axle differential lock indicator on and off.
Rear Axle Differential Lock Low Control Relay	This output control is used to turn the rear axle differential lock low control relay on and off.

K40D Driver Seat Adjuster Memory Module: Scan Tool Information

Seat Position Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Driver Seat Back Switch	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat recline switch is pressed, the scan tool displays the direction for which the switch is pressed.
Driver Seat Back Direction Command	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat recline switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat recline motor.
Driver Seat Back Position	Varies	The scan tool displays 0–65,535 counts. The module counts the number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat back is in the forward position, while low count values indicate that the seat back is in the rearward position.
Driver Seat Cushion Front Vertical Direction Command	Inactive	The scan tool displays Inactive, Up or Down. When the seat front vertical switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat front vertical motor.
Driver Seat Cushion Front Vertical Position	Varies	The scan tool displays 0–65,535 counts. The module counts the number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat front vertical is in the up position, while low count values indicate that the seat front vertical is in the down position.
Driver Seat Cushion Front Vertical Switch	Inactive	The scan tool displays Inactive, Up or Down. When the seat front vertical switch is pressed, the scan tool should display the direction for which the switch is pressed.
Driver Seat Cushion Rear Vertical Direction Command	Inactive	The scan tool displays Inactive, Up or Down. When the seat rear vertical switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat rear vertical motor.
Driver Seat Cushion Rear Vertical Position	Varies	The scan tool displays 0–65,535 counts. The module counts the number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat rear vertical is in the up position, while low count values indicate that the seat rear vertical is in the down position.
Driver Seat Cushion Rear Vertical Switch	Inactive	The scan tool displays Inactive, Up or Down. When the seat rear vertical switch is pressed, the scan tool should display the direction for which the switch is pressed.
Driver Seat Horizontal Direction Command	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat horizontal switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat horizontal motor.
Driver Seat Horizontal Position	Varies	The scan tool displays 0–65,535 counts. The module counts the number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat horizontal position is forward, while low count values indicate that the seat horizontal position is rearward.
Driver Seat Horizontal Switch	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat horizontal switch is pressed, the scan tool should display the direction for which the switch is pressed.
Driver Seat Lumbar Support Horizontal Switch	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat lumbar horizontal switch is pressed, the scan tool should display the direction for which the switch is pressed.
Driver Seat Lumbar Support Horizontal Direction Command	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat lumbar horizontal switch is pressed, the scan tool displays the direction the memory control module is commanding the seat lumbar horizontal motor.
Lumbar Support Horizontal Position	Varies	The module stores the pressure information for lumbar position.

Parameter	Expected Value	Definition
Driver Seat Lumbar Support Vertical Switch	Inactive	The scan tool displays Inactive, Up, or Down. When the seat lumbar vertical switch is pressed, the scan tool should display the direction for which the switch is pressed.
Driver Seat Lumbar Support Vertical Direction Command	Inactive	The scan tool displays Inactive, Up, or Down. When the seat lumbar vertical switch is pressed, the scan tool displays the direction the memory control module is commanding the seat lumbar vertical motor.
Driver Seat Memory Recall Switches	Inactive	The scan tool displays Inactive, Memory 1, Memory 2, or Exit. When a memory function switch is pressed, the scan tool should momentarily display the function selected.
Driver Seat Memory Set Switch	Inactive	The scan tool displays Inactive/Active. When the memory SET switch is pressed, the scan tool should display Active.
Driver Seat Back Side Bolster Direction Command	Inactive	The scan tool displays Inactive, Inflate, or Deflate. When the seat back side bolster switch is pressed, the scan tool displays the function the memory control module is commanding the seat lumbar/bolster pump.
Driver Seat Back Side Bolster Switch	Inactive	The scan tool displays Inactive, Inflate, or Deflate. When the seat back side bolster switch is pressed, the scan tool should display the function for which the switch is pressed.
Driver Seat Cushion Side Bolster Direction Command	Inactive	The scan tool displays Inactive, Inflate, or Deflate. When the seat back side bolster switch is pressed, the scan tool displays the function the memory control module is commanding the seat lumbar/bolster pump.
Driver Seat Cushion Side Bolster Switch	Inactive	The scan tool displays Inactive, Inflate, or Deflate. When the seat back side bolster switch is pressed, the scan tool should display the function for which the switch is pressed.
Seat Massage Switch	Inactive	The scan tool displays Inactive/Active. When the seat massage switch s pressed, the scan tool should display Active.

Mirror Memory Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Mirror Select Switch	None	The scan tool displays None, Driver Door, or Passenger Door. The scan tool displays the current state of the mirror select switch.
Mirror Direction Switch	Inactive	The scan tool displays Inactive/Up/Down/Left/Right/Folding/Extending. The scan tool displays the current state of the power mirror switch as pressed.
Driver Mirror Direction Command	Inactive	The scan tool displays Inactive/Up/Down/Left/Right. When the power mirror switch is being used or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the driver mirror motors.
Driver Mirror Vertical Position	Varies	The scan tool displays 0–5 V. The voltage displayed represents the position of the driver vertical motor. High voltage values indicate the mirror position is up, while low count values indicate the mirror position is down.
Driver Mirror Horizontal Position	Varies	The scan tool displays 0–5 V. The voltage displayed represents the position of the driver horizontal motor. High voltage values indicate the mirror position is to the right or in, while low count values indicate the mirror position is to the left or out.
Passenger Mirror Direction Command	Inactive	The scan tool displays Inactive/Up/Down/Left/Right. When the power mirror switch is being used or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the passenger mirror motors.

Parameter	Expected Value	Definition
Passenger Mirror Vertical Position	Varies	The scan tool displays 0–5 V. The voltage displayed represents the position of the passenger vertical motor. High voltage values indicate the mirror position is up, while low count values indicate the mirror position is down.
Passenger Mirror Horizontal Position	Varies	The scan tool displays 0–5 V. The voltage displayed represents the position of the passenger horizontal motor. High voltage values indicate the mirror position is to the right or in, while low count values indicate the mirror position is to the left or out.

Steering Column Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Steering Column Direction Switch	Varies	The scan tool displays Inactive, Forward, Rearward, Up, or Down. When the steering column switch is pressed, the scan tool should display the direction for which the switch is pressed.
Steering Column Direction Command	Varies	The scan tool displays Inactive, Forward, Rearward, Up, or Down. When the module is commanding movement of the column, the scan tool should display the direction the module is commanding the column to move in.
Steering Column Vertical Position	Varies	The scan tool displays 0–5 V. The voltage displayed is an input to the seat memory control module from the steering column vertical position sensor. Higher voltage readings indicates the steering wheel position is up while lower voltage readings indicate the steering wheel position is down.
Steering Column Horizontal Position	Off	The scan tool displays 0–5 V. The voltage displayed is an input to the seat memory control module from the steering column vertical position sensor. Higher voltage readings indicates the steering wheel position is forward toward the front of the vehicle or away from the driver while lower voltage readings indicate the steering wheel position is rearward toward the driver.

Seat Memory Scan Tool Control Functions

Control Functions	Description
Driver Seat Back Horizontal Movement	This output control is used to command the driver seat back recline position Forward and Rearward.
Driver Seat Cushion Front Vertical Movement	This output control is used to command the driver seat cushion front vertical position Up and Down.
Driver Seat Cushion Rear Vertical Movement	This output control is used to command the driver seat cushion rear vertical position Up and Down.
Driver Seat Horizontal Movement	This output control is used to command the driver seat horizontal position Forward and Rearward.
Driver Seat Back Side Bolster Movement	This output control is used to command the driver seat back side bolster support to Inflate or Deflate.
Driver Seat Lumbar Support Horizontal Movement	This output control is used to command the driver seat lumbar horizontal position Forward and Rearward.
Driver Seat Lumbar Support Vertical Movement	This output control is used to command the lumbar vertical position Up and Down.

Mirror Memory Scan Tool Control Functions

Control Functions	Description
Driver Mirror Fold	This output control is used to command the driver mirror to fold and unfold.
Driver Mirror Movement	This output control is used to command the driver mirror up and down or left and right.

Control Functions	Description
Passenger Mirror Fold	This output control is used to command the passenger mirror to fold and unfold.
Passenger Mirror Movement	This output control is used to command the passenger mirror up and down or left and right.

Adjustable Steering Column Scan Tool Control Functions

Control Functions	Description
Steering Column Tilt Up Command	This output control is used to command the steering column to the up position.
Steering Column Tilt Down Command	This output control is used to command the steering column to the down position.
Steering Column Telescope Forward Command	This output control is used to command the steering column to the forward position.
Steering Column Telescope Rearward Command	This output control is used to command the steering column to the rearward position.

Seat Cushion Haptic Motors Scan Tool Control Functions

Control Functions	Description
Driver Seat Cushion Left Rear Haptic Movement	This output control is used to Enable and Disable the driver seat cushion left rear haptic motor function.
Driver Seat Cushion Right Rear Haptic Movement	This output control is used to Enable and Disable the driver seat cushion right rear haptic motor function.

K40P Passenger Seat Adjuster Memory Module: Scan Tool Information

Seat Memory Control Module Scan Tool Data Display Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Passenger Seat Back Switch	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat recline switch is pressed, the scan tool displays the direction for which the switch is pressed.
Passenger Seat Back Direction Command	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat recline switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat recline motor.
Passenger Seat Back Position	Varies	The scan tool displays 0–65,535 counts. The module counts the number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat back is in the forward position, while low count values indicate that the seat back is in the rearward position.
Passenger Seat Cushion Front Vertical Direction Command	Inactive	The scan tool displays Inactive, Up or Down. When the seat front vertical switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat front vertical motor.
Passenger Seat Cushion Front Vertical Position	Varies	The scan tool displays 0–65,535 counts. The module counts the number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat front vertical is in the up position, while low count values indicate that the seat front vertical is in the down position.
Passenger Seat Cushion Front Vertical Switch	Inactive	The scan tool displays Inactive, Up or Down. When the seat front vertical switch is pressed, the scan tool will display the direction for which the switch is pressed.

Parameter	Expected Value	Definition
Passenger Seat Cushion Rear Vertical Direction Command	Inactive	The scan tool displays Inactive, Up or Down. When the seat rear vertical switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat rear vertical motor.
Passenger Seat Cushion Rear Vertical Position	Varies	The scan tool displays 0–65,535 counts. The module counts the number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat rear vertical is in the up position, while low count values indicate that the seat rear vertical is in the down position.
Passenger Seat Cushion Rear Vertical Switch	Inactive	The scan tool displays Inactive, Up or Down. When the seat rear vertical switch is pressed, the scan tool will display the direction for which the switch is pressed.
Passenger Seat Horizontal Direction Command	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat horizontal switch is pressed or when a memory recall occurs, the scan tool displays the direction the memory control module is commanding the seat horizontal motor.
Passenger Seat Horizontal Position	Varies	The scan tool displays 0–65,535 counts. The module counts the number of pulse signals with each rotation of the motor that the scan tool displays as counts. High count values indicate that the seat horizontal position is forward, while low count values indicate that the seat horizontal position is rearward.
Passenger Seat Horizontal Switch	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat horizontal switch is pressed, the scan tool will display the direction for which the switch is pressed.
Passenger Seat Lumbar Support Horizontal Switch	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat lumbar horizontal switch is pressed, the scan tool will display the direction for which the switch is pressed.
Passenger Seat Lumbar Support Horizontal Direction Command	Inactive	The scan tool displays Inactive, Forward, or Rearward. When the seat lumbar horizontal switch is pressed, the scan tool displays the direction the memory control module is commanding the seat lumbar horizontal motor.
Passenger Seat Lumbar Support Horizontal Position	Varies	
Passenger Seat Lumbar Support Vertical Switch	Inactive	The scan tool displays Inactive, Up, or Down. When the seat lumbar vertical switch is pressed, the scan tool will display the direction for which the switch is pressed.
Passenger Seat Lumbar Support Vertical Direction Command	Inactive	The scan tool displays Inactive, Up, or Down. When the seat lumbar vertical switch is pressed, the scan tool displays the direction the memory control module is commanding the seat lumbar vertical motor.
Passenger Seat Back Side Bolster Switch	Inactive	The scan tool displays Inactive, In, or Out. When the seat back side bolster switch is pressed, the scan tool will display the function for which the switch is pressed.
Passenger Seat Back Side Bolster Direction	Inactive	The scan tool displays Inactive, In or Out. When the seat back side bolster switch is pressed, the scan tool displays the function the memory control module is commanding the seat lumbar/ bolster pump.
Seat Cushion Side Bolster Switch	Inactive	The scan tool displays Inactive, In, or Out. When the seat back side bolster switch is pressed, the scan tool will display the function for which the switch is pressed.
Seat Cushion Side Bolster Direction Command	Inactive	The scan tool displays Inactive, In or Out. When the seat back side bolster switch is pressed, the scan tool displays the function the memory control module is commanding the seat lumbar/ bolster pump.
Passenger Seat Memory Recall Switches	Inactive	The scan tool displays Inactive, Memory 1, Memory 2, or Exit. When a memory function switch is pressed, the scan tool should momentarily display the function selected.

Parameter	Expected Value	Definition
Passenger Seat Memory Set Switch	Inactive	The scan tool displays Inactive/Active. When the memory SET switch is pressed, the scan tool should display Active.
Seat Massage Switch	Inactive	The scan tool displays Inactive/Active. When the massage switch is pressed, the scan tool should display Active.

Seat Memory Control Module Scan Tool Control Functions

Control Functions	Description
Seat Back Direction Command	This output control is used to command the seat back recline position Forward and Rearward.
Seat Back Side Bolster Direction Command	This output control is used to command the seat back side bolster position In or Out.
Seat Cushion Side Bolster Direction Command	This output control is used to command the seat cushion side bolster position In or Out.
Seat Cushion Front Vertical Direction Command	This output control is used to command the seat cushion front vertical position Up and Down.
Seat Cushion Rear Vertical Direction Command	This output control is used to command the seat cushion rear vertical position Up and Down.
Seat Horizontal Directional Command	This output control is used to command the seat horizontal position Forward and Rearward.
Lumbar Support Horizontal Direction Command	This output control is used to command the seat lumbar horizontal position Forward and Rearward.
Lumbar Support Vertical Direction Command	This output control is used to command the seat lumbar vertical position Up and Down.

K43 Power Steering Control Module: Scan Tool Information

Power Steering Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
Ignition Cycle Counter	—	Varies	This displays the number of ignition cycles.
ECU Internal Temperature	—	Varies	This displays ° C. This is the current internal temperature of the ECU
Steering Wheel Angle	—	Varies	This displays Degrees. This displays the current steering wheel angle in degrees.
EPS Motor Overload Protection Counter	—	Varies	This displays counts. This displays the Electric Power Steering Motor Overload Protection Incidents counter.
EPS System Status	—	True/False	Indicates the status of Vehicle Speed Validity, AHA Calibration, and AHA Setup Procedure.
Engine Speed	—	0 RPM	This displays RPM. This is the current engine speed from the ECM.
Vehicle Speed Low Resolution	—	0 Km/h (0 MPH)	This displays km/h (mph). This is the current vehicle speed.

Parameter	System State	Expected Value	Description
Vehicle Speed Medium Resolution	—	0 Km/h (0 MPH)	This displays km/h (mph). This is the current vehicle speed.
Driver Mode Control State	—	No Actcion/Performance Mode 1–7	This displays the current drive mode.
Steering Wheel Angle Gradient	—	Varies	This displays degrees/sec. This is the rate at which the steering angle is changing.
AHA Coil Current Commanded	—	Varies	This displays the amount of current commanded by the AHA coil..
AHA Coil Current Measured	—	Varies	This displays the actual measured current of the AHA coil.
AHA Right Hydraulic Pressure	—	Varies	This is the current pressure (Bar) of the right side of the AHA system.
AHA Left Hydraulic Pressure	—	Varies	This is the current pressure (Bar) of the left side of the AHA system.
AHA Differential Hydraulic Pressure	—	Varies	This is the current pressure (Bar) of the differential in the AHA system.
AHA Pull Hydraulic Pressure Compensation Value	—	Varies	This displays the AHA pull hydraulic pressure compensation value (Bar).
Time Since Ignition On	—	Varies	This displays the time (ms) since the ignition was switched to ON.
System Power Mode	—	OFF/ACC/RUN/Crank Request	This displays the current power mode.
Battery Voltage	—	Varies	This displays the current battery voltage.
Engine Running Status	—	True/False	This displays the engine running status.
AHA System Status	—	Disable/Off/Operate/Warm Initialization	This displays the current status of the AHA system

Power Steering Control Module Scan Tool Output Controls

Output Control	Description
Cancel All Active Device Controls	Command to cancel any active device controls.
Steering Assist Control	Command to enable or disable Power Assist and to change Power Assist Mode.
Reset Adaptive Data	Command to reset adaptive parameters to default/unlearned values. The AHA ECU shall reset both short and long term pull compensation values.
Clear End of Line Gear Parameters	Command to clear the end of line gear parameters to their default values.
Pressure Sensor Trim	Command to trim the pressure sensor. Set Trim shall set the pressure trim value to the current Pressure 1 sensor input and Pressure 2 sensor input and set the pressure trim performed flag to indicate that a trim has been performed.
AHA Device Controls	Ignition cycle values while this command is active shall not be permanently stored. Values will only be retained for one ignition cycle.
System Basic Functions	Command to disable all device outputs of the AHA ECU.

K44 Power Take-off Control Module: Scan Tool Information

The scan tool data lists contain all of the power take-off (PTO) related parameters that are available on the scan tool. The parameters in the list are arranged in alphabetical order. The data list column indicates the location of the parameter within the scan tool menu selections.

Use the scan tool data lists as directed by a diagnostic table or in order to supplement the diagnostic procedures. Begin all of the diagnostic procedures with Diagnostic System Check – Vehicle .

Use the scan tool data lists only after the following is determined:

- There is no published DTC procedure or published symptom procedure for the customer concern.
- The DTC or symptom procedure indicated by the diagnostic system check does not resolve the customer concern.

Engine Speed Power Take-Off Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature/Vehicle is in Park or Neutral/PTO Disengaged			
Engine Speed	—	Varies	The scan tool displays 0 to 9,999 RPM. The engine control module (ECM) monitors the crankshaft position (CKP) signal circuit in order to determine the engine RPM.
Ignition 1 Signal	—	Varies	The scan tool displays Volts. This is the voltage at the B+ input of the PTOM.
PTO Disengage Reason	—	Last reason why PTO was disengaged	The scan tool displays the last reason why the PTO was disengaged. Refer to the Scan Tool Data Definitions (Disengage or Inhibit Reasons) for descriptions.
PTO Indicator	—	Off	The scan tool displays On or Off. The PTOM monitors the signal circuit of the PTO switch. A closed switch is displayed as On.
PTO Inhibit Reason	—	Reason why PTO is currently inhibited	The scan tool displays the last reason why the PTO system was inhibited. Refer to the Scan Tool Data Definitions (Disengage or Inhibit Reasons) for descriptions.
PTO In Cab Switch	—	PTO Off	The scan tool displays PTO Off, PTO On, Set 1, Set 2, No Action, Invalid, or Indeterminate. The PTOM monitors the signal circuit of the PTO switch.
PTO In Cab Switch A	—	Numeric	The scan tool displays %. The PTOM monitors the mode select A circuit and displays the current percentage.
PTO In Cab Switch B	—	Numeric	The scan tool displays %. The PTOM monitors the mode select B circuit and displays the current percentage.
PTO In Cab Switch C	—	Numeric	The scan tool displays %. The PTOM monitors the mode select C circuit and displays the current percentage.
PTO Option	—	Disable	The scan tool displays Enhanced, Disable, Preset, Variable, Mobile, or Fast Idle. This is the current state of the PTO system.
PTO Remote Accelerator Sensor (If Equipped)	—	Numeric	The scan tool displays %. If equipped, the ECM sends a serial data message to the PTO module regarding the status of the PTO remote accelerator sensor.
PTO Remote Switch Status	—	PTO Off	The scan tool displays PTO Off, PTO On, Set 1, Set 2, No Action, Invalid, or Indeterminate. The PTOM monitors the signal circuit of the PTO remote switch.
PTO Status	—	No	The scan tool displays Disabled, Standby Disabled, Standby Pending, PTO Standby, PTO Active, Reserved, PTO Set, PTO Coast, Reserved, PTO Accelerate, Shutdown, or No Action. This is the current status of the PTO system.

Parameter	System State	Expected Value	Description
Requested Engine Speed	—	Varies	The scan tool displays the requested RPM.
Vehicle Speed	—	Varies	The scan tool displays 0 to 150 km/h (93.2 mph). The ECM monitors the vehicle speed sensor signal circuit in order to calculate the vehicle speed for display. The ECM sends a serial data message to the PTOM regarding the current vehicle speed.

Engine Speed Power Take-Off Control Module Scan Tool Output Controls

Output Control	Description
Clear PTO Reasons	The scan tool clears the PTO Disengagement and Inhibit reasons stored in the PTO module.
Engine Shutdown	The scan tool commands the PTO module to shut down the engine.
PTO Indicator	The scan tool commands the PTO module to illuminate the PTO indicator on and off.
PTO Relay	The scan tool commands the PTO module to enable and disable the PTO relay.

K60 Column Lock Module: Scan Tool Information

Scan Tool Data Parameters

Parameter	Expected Value	Description
Operating Conditions: Ignition ON		
Column Lock Status	Locked Invalid Unlocked Unknown	The scan tool displays Failed, Unknown, Locked and Unlocked. The scan tool displays the current state of the column lock.
Turn Steering Wheel, Start Vehicle Again Display Message	Inactive Active	The scan tool displays Active/Inactive. If the wheels are against a curb, the lock pin may not be able to pull out. A message for the driver that is displayed on the Driver Information Center. The scan tool displays the need to turn the steering wheel, turn off the vehicle and then restart the vehicle.
Steering Column Lock Indicator	Inactive Active	The scan tool displays Active/Inactive. The scan tool displays the current state of the column lock.

K68 Trailer Lighting Control Module: Scan Tool Information

Body Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON, Vehicle in Park.			
Battery Voltage	—	Varies	The scan tool displays the current battery voltage.
Brake Pedal Switch Status	—	Active/Inactive	The scan tool displays the status of the brake pedal
State of Charge	—	Varies	The scan tool displays percentage. This parameter displays state of charge status.
System Voltage	—	Varies	The scan tool displays the current system voltage.
Trailer Connection Status	—	Connected/Not Connected	The scan tool displays the trailer connected status.

Body Control Module Scan Tool Output Controls

Scan Tool Output Control	Description
Left Trailer Turn Signal/ Stop Lamp Command	The Trailer Lighting Control Module activates the left trailer turn signal/stop lamp control circuit when you select Active. B+ should be applied to terminal G at the X88 Trailer Connector.
Right Trailer Turn Signal/ Stop Lamp Command	The Trailer Lighting Control Module activates the right trailer turn signal/stop lamp control circuit when you select Active. B+ should be applied to terminal D at the X88 Trailer Connector.
Left Trailer Tail Lamp	The Trailer Lighting Control Module activates the trailer park lamp control circuit when you select Active. B+ should be applied to terminal F at the X88 Trailer Connector.
Right Trailer Tail Lamp	The Trailer Lighting Control Module activates the trailer park lamp control circuit when you select Active. B+ should be applied to terminal F at the X88 Trailer Connector.
Trailer Backup Lamps	The Trailer Lighting Control Module activates the trailer backup lamp control circuit when you select Active. B+ should be applied to terminal A at the X88 Trailer Connector.

K69 Transfer Case Control Module: Scan Tool Information

Scan Tool Data Parameters

Parameter	Expected Value	Expected Value	Description
Operating Conditions: Ignition ON, engine OFF, Park or Neutral, and transfer case in 2WD, unless otherwise noted.			
2WD High Range Indicator Command	ON or OFF	ON	This parameter displays ON when the transfer case control module commands the 2WD High indicator light ON.
2WD High Range Indicator Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 2WD High range indicator control circuit. The 2WD High range indicator control circuit is made up of the indicator dimming control circuit and the 2WD High indicator control circuit. A short to battery on the 2WD High indicator control circuit will cause this parameter to display Malfunction.
2WD High Range Indicator Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 2WD High range indicator control circuit. The 2WD High range indicator control circuit is made up of the indicator dimming control circuit and the 2WD High indicator control circuit. A short to ground on the 2WD High indicator control circuit will cause this parameter to display Malfunction.
2WD High Range Indicator Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 2WD High range indicator control circuit. The 2WD High range indicator control circuit is made up of the indicator dimming control circuit and the 2WD High indicator control circuit. An open on the 2WD High indicator control circuit will cause this parameter to display Malfunction.
4WD Automatic Range Indicator Command	ON or OFF	OFF	This parameter displays ON when the transfer case control module commands the Auto 4WD indicator ON.
4WD Automatic Range Indicator Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD automatic range indicator control circuit. The 4WD automatic range indicator control circuit is made up of the indicator dimming control circuit and the AWD indicator control circuit. A short to battery on the AWD indicator control circuit will cause this parameter to display Malfunction.
4WD Automatic Range Indicator Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD automatic range indicator control circuit. The 4WD automatic range indicator control circuit is made up of the indicator dimming control circuit and the AWD indicator control circuit. A short to ground on the AWD indicator control circuit will cause this parameter to display Malfunction.

Parameter	Expected Value	Expected Value	Description
4WD Automatic Range Indicator Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD automatic range indicator control circuit. The 4WD automatic range indicator control circuit is made up of the indicator dimming control circuit and the AWD indicator control circuit. An open on the AWD indicator control circuit will cause this parameter to display Malfunction.
4WD High Range Indicator Command	ON or OFF	OFF	This parameter displays ON when the transfer case control module commands the 4WD High indicator light ON.
4WD High Range Indicator Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD High range indicator control circuit. The 4WD High range indicator control circuit is made up of the indicator dimming control circuit and the 4WD High indicator control circuit. A short to battery on the 4WD High indicator control circuit will cause this parameter to display Malfunction.
4WD High Range Indicator Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD High range indicator control circuit. The 4WD High range indicator control circuit is made up of the indicator dimming control circuit and the 4WD High indicator control circuit. A short to ground on the 4WD High indicator control circuit will cause this parameter to display Malfunction.
4WD High Range Indicator Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD High range indicator control circuit. The 4WD High range indicator control circuit is made up of the indicator dimming control circuit and the 4WD High indicator control circuit. An open on the 4WD High indicator control circuit will cause this parameter to display Malfunction.
4WD Low Range Indicator Command	ON or OFF	OFF	This parameter displays ON when the transfer case control module commands the 4WD Low indicator light ON.
4WD Low Range Indicator Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD Low range indicator control circuit. The 4WD Low range indicator control circuit is made up of the indicator dimming control circuit and the 4WD Low indicator control circuit. A short to battery on the 4WD Low indicator control circuit will cause this parameter to display Malfunction.
4WD Low Range Indicator Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD Low range indicator control circuit. The 4WD Low range indicator control circuit is made up of the indicator dimming control circuit and the 4WD Low indicator control circuit. A short to ground on the 4WD Low indicator control circuit will cause this parameter to display Malfunction.
4WD Low Range Indicator Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the 4WD Low range indicator control circuit. The 4WD low range indicator control circuit is made up of the indicator dimming control circuit and the 4WD Low indicator control circuit. An open on the 4WD Low indicator control circuit will cause this parameter to display Malfunction.
Brake Pedal Position Sensor Signal	Active/Released	Released	The scan tool displays Inactive or Active depending on the state of the brake pedal.
Calculated Transfer Case Clutch Temperature	°C/°F	Varies	This parameter displays the estimated clutch temperature.
Control Module Voltage	0.0 to 25.5 V	Battery Voltage	This parameter displays the voltage measured by the transfer case control module at the battery positive voltage circuit.
Current Transmission Gear	Park, Reverse, Neutral, 1, 2, 3, 4, 5, and 6	Park or Neutral	This parameter displays the current estimated gear the transmission is in. The scan tool displays Park, Reverse, and Neutral when ignition ON and engine OFF. The scan tool displays Park, Reverse, Neutral, 1, 2, 3, 4, 5, and 6 when engine ON.

Parameter	Expected Value	Expected Value	Description
Display Dimming	0 to 100%	Varies	This parameter displays the interior dimming display level being supplied by the body control module to the transfer case shift control switch.
Engine Run Time	hh:mm:ss	Varies	This parameter displays the time since Engine Start.
Engine Speed	RPM	Varies	This parameter displays engine RPM.
Front Axle Engagement Actuator Command	Engaged or Disengaged	Disengaged	This parameter displays either Engaged or Disengaged. Engaged when the body control module is commanding Auto 4WD, 4WD, or 4WD Low ranges, and Disengaged when the body control module is commanding Neutral, or 2WD ranges.
Front Axle Engagement Actuator Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the front axle engagement actuator control circuit. A short to battery on the front axle engagement actuator control circuit will cause this parameter to display Malfunction.
Front Axle Engagement Actuator Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the front axle engagement actuator control circuit. A short to ground on the front axle engagement actuator control circuit will cause this parameter to display Malfunction.
Front Axle Engagement Actuator Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the front axle engagement actuator control circuit. An open/high resistance condition on the front axle engagement actuator control circuit will cause this parameter to display Malfunction.
Front Axle Feedback Switch	Engaged or Disengaged	Disengaged	This parameter displays the actual status of the front axle. The parameter will display Engaged when the system is in Auto 4WD, 4WD, or 4WD Low modes, and Disengaged when the system is in Neutral, or 2WD High or Neutral mode.
Ignition 1 Signal	ON or OFF	ON	This parameter displays the status of the run/crank ignition 1 voltage circuit to the transfer case control module.
Ignition Accessory Signal	ON or OFF	ON	This parameter displays the status of the ignition accessory signal circuit to the transfer case control module.
Left Front Wheel Speed Sensor	Varies	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the left front wheel speed sensor.
Left Rear Wheel Speed Sensor	Varies	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the left rear wheel speed sensor.
Non-Driven Wheel Speed	Varies	km/h/MPH	This parameter displays the non-drive wheel speed in kilometers or miles per hour.
Power Mode	OFF, Accessory, Run or Crank Request	Run	This parameter displays the status of the ignition switch.
Range Actuator Command	−100 to +100%	0%	This parameter displays the pulse width modulated voltage signal being supplied by the transfer case control module to the transfer case encoder motor on circuit A or circuit B. The scan tool displays negative values when turning counter-clockwise or positive values when turning clockwise. This parameter will display 0% after a range shift.
Range Actuator Control Circuit High Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the range actuator control circuit. The range actuator control circuit is made up of the range actuator control circuit A and the range actuator control circuit B. A short to battery on the range actuator control circuit A or the range actuator control circuit B will cause this parameter to display Malfunction.
Range Actuator Control Circuit Low Voltage Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the range actuator control circuit. The range actuator control circuit is made up of the range actuator control circuit A and the range actuator control circuit B. A short to ground on the range actuator control circuit A or the range actuator control circuit B will cause this parameter to display Malfunction.

Parameter	Expected Value	Expected Value	Description
Range Actuator Control Circuit Open Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the range actuator control circuit. The range actuator control circuit is made up of the range actuator control circuit A and the range actuator control circuit B. An open on the range actuator control circuit A or the range actuator control circuit B will cause this parameter to display Malfunction.
Range Actuator Control Circuit Shorted Test Status	Not Run, OK or Malfunction	OK	This parameter monitors the status of the range actuator control circuit. The range actuator control circuit is made up of the range actuator control circuit A and the range actuator control circuit B. A short to ground, short to battery or short together on the range actuator control circuit A and/or the range actuator control circuit B will cause this parameter to display Malfunction.
Range Actuator Current	−15.0 to +36.0 A	0.0 A	This parameter displays the current drawn by the range actuator from the transfer case control module on either the range actuator control circuit A or the range actuator control circuit B. Typical values display 0.0 to 12.0 A. This parameter will display 0.0 A after shifting ranges.
Range Actuator Direction	Invalid, Stationary, Clockwise or Counter-clockwise	Stationary	This parameter displays what direction the transfer case range actuator is actually turning.
Range Actuator Direction Command	Invalid, Stationary, Clockwise or Counter-clockwise	Stationary	This parameter displays what direction the transfer case control module is commanding the range actuator to turn. This parameter will display Stationary after a range change.
Range Actuator Learn Status	Not Learned, Passed, Failed, Aborted, or In Progress	Passed	This parameter displays the status of the last range actuator learn attempt.
Range Actuator Lock Command	Disengaged or Engaged	Disengaged	This parameter displays the commanded status of the range actuator lock. The lock will be engaged in Auto 4WD, 4WD High, or 4WD Low, and Disengaged in 2WD High and Neutral.
Range Actuator Position	2WD, 4WD High–2WD 4WD High/ Locked, 4WD High–Neutral, Neutral, Neutral–4WD Low, or 4WD Low	2WD	This parameter displays the actual position of the transfer case according to the range actuator position sensor.
Range Actuator Position Sensor	–150 to 210°	35°	This parameter displays the position of the range actuator position sensor in degrees. Typical scan tool displays: • 2WD High = 20–50° • 4WD Auto = 30–210° • 4WD High = 110–210° • 4WD Low = −150 to –55° • Neutral = −10 to +10°
Range Actuator Position Sensor	0.35–4.6 V	Varies	This parameter displays the voltage being returned from the range actuator position sensor. The range actuator position sensor is also known as the incremental position sensor.
Range Actuator Position Sensor Direction Signal	Volts	Varies	Range Actuator Direction Signal A/D – 8 Volt Reference

Parameter	Expected Value	Expected Value	Description
Range Actuator Position Sensor Low Reference Command	ON or OFF	OFF	This parameter displays the commanded status of the range actuator position sensor low reference circuit.
Range Actuator Position Sensor Supply Voltage Command	ON or OFF	OFF	This parameter displays the commanded status of the range actuator position sensor supply voltage circuit.
Requested Transfer Case Clutch Torque	newtonm	Varies	This parameter displays the commanded torque to be held by the transfer case clutch.
Right Front Wheel Speed Sensor	Varies	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the right front wheel speed sensor.
Right Rear Front Wheel Speed Sensor	Varies	0 km/h (0 MPH)	The scan tool displays km/h (MPH) depending on the current speed of the right rear wheel speed sensor.
Sensor Reference Voltage 1	4.8–5.2 V	5.0 V	This parameter displays the voltage being supplied by the transfer case control module to the transfer case range position switch.
Sensor Reference Voltage 2	7.75–8.25 V	8.0 V	This parameter displays the voltage being supplied by the transfer case control module to the range actuator position sensor. The range actuator position sensor is also known as the incremental position sensor.
Sensor Reference Voltage 3	4.8–5.2 V	5.0 V	This parameter displays the voltage being supplied by the transfer case control module to the transfer case range selector switch.
Service 4WD Indicator Command	ON or OFF	OFF	This parameter displays ON anytime a DTC sets.
Software Part Number	Current Software Release	—	This parameter displays the numbers or characters assigned to the current version of software used in the transfer case control module. The scan tool displays an alphanumeric value.
Steering Wheel Angle	Steering wheel in straight position	−5 to +5°	The scan tool displays °. This is the current position of the steering angle sensor.
	Steering wheel turned left until stop	450–550°	
	Steering wheel turned right until stop	−550 to −450°	
Transfer Case Clutch Torque	newtonm	0.0	This parameter displays the estimated torque being held by the transfer case clutch.
Transfer Case Commanded Position	2WD, 4WD High/Locked, 4WD Low, Neutral or None	2WD	This parameter displays the current range commanded by the driver.
Transfer Case Neutral Range Indicator Command	ON or OFF	OFF	This parameter displays ON when the transfer case control module commands the Neutral indicator light ON.
Transfer Case Output Shafts Slip Speed	0–8,192 RPM	Varies	This parameter displays the difference between the rotational speeds of the transfer case front and rear output shafts.
Transfer Case Range	Invalid, Neutral, 2WD, 4WD/AWD Automatic, 4WD High/ Locked, 4WD Low, 4WD Unlocked	2WD	This parameter displays the current mode the transfer case is in, as indicated by the transfer case range position switch.
Transfer Case Range Position Sensor	°	35°	This parameter displays the position of the rotational position sensor in degrees.

Parameter	Expected Value	Expected Value	Description
Transfer Case Range Position Sensor	190–210 Hz	199 Hz	This parameter displays the frequency of the current being supplied to the range position sensor.
Transfer Case Range Position Sensor	0–100%	24% (±5%)	This parameter displays the position of the range position sensor in percent. Typical scan tool values: • 2WD = 24% • 4WD High = 5% • 4WD Low = 95% • Neutral = 5%
Transfer Case Range Selection Switch	0.0–5.0 V	2.0 V (±0.2 V)	This parameter displays the voltage being returned from the transfer case range selection switch. Typical scan tool displays: • 2WD = 2.0 V • 4WD High/Locked = 3.0 V • 4WD Low = 1.5 V • Neutral = 2.5 V
Transfer Case Range Selection Switch State	2WD, 4WD High/Locked, 4WD Low, Neutral or None	2WD	This parameter displays the current range commanded by the transfer case range selection switch. This parameter displays the transfer case shift control switch mode currently selected by the driver.
Transmission Fluid Temperature	°C (°F)	Varies	This parameter displays the transmission fluid temperature in degrees Celsius or Fahrenheit.
Transmission Gear	Park, Reverse, Neutral, 1, 2, 3, 4, 5, and 6	Park or Neutral	This parameter displays the current commanded gear the transmission is in. The scan tool displays Park, Reverse and Neutral when ignition ON and engine OFF. The scan tool displays Park, Reverse, Neutral, 1, 2, 3, 4, 5, and 6 when engine ON.
Transmission OSS	RPM	Varies	This parameter displays transmission output shaft speed in revolutions per minute.
Variation Allowed Between Transfer Case Range Position Sensor and Range Actuator Position Sensor	°	Varies	This parameter displays the allowed variation between transfer case range position sensor and the range actuator position sensor.
Variation Between Transfer Case Range Position Sensor and Range Actuator Position Sensor	°	Varies	This parameter displays the actual variation between transfer case range position sensor and the range actuator position sensor.
Vehicle Speed	0–327 km/h (0–204 MPH)	Varies	This parameter displays vehicle speed in kilometers or miles per hour.
Vehicle Stability Control Request	%	Varies	Vehicle stability enhancement system coupling request value
Vehicle Identification Number	—	Varies	A unique 17 character vehicle identifier

Scan Tool Output Controls

Output Control	Description
Note: Transmission must be in transmission neutral for any of these output controls to operate. Refer to the scan tool manual for complete scan tool operating instructions.	
Front Axle Engagement Actuator	**Note:** Transmission must be in transmission Neutral for this output control to operate. This function allows the technician to command the front axle to engage or disengage.

Output Control	Description
Range Actuator (if equipped)	This function is intended to activate the range actuator control circuits. The range actuator control circuits can be commanded OFF or ON, in either the clockwise or counter-clockwise direction, to ensure all portions of the control module driver are operational. This device control can be operated with the actuator connected to verify actuator operation, or disconnected for circuit testing. The activation of this control must ensure the range actuator lock is activated as well to ensure actuator movement when the range actuator is plugged in. If the device control is activated with the range actuator plugged in, the range actuator shall return to the nearest legal range position after return to normal control.
Range Actuator Lock	**Note:** You may need to perform an ignition OFF in order to recover. This function allows the technician to command the range actuator lock to engage or disengage.
Range Actuator Learn	**Note:** This does not work in 2WD High. This function allows the technician to command the transfer case control module to relearn the clutch status after the range actuator, control module, or transfer case has been replaced.
Transfer Case Clutch Engagement	This function is used to override the clutch capacity command of the all wheel drive clutch output.
Transfer Case Clutch Identifier	This device control is used to program the transfer case clutch identifier.
Transfer Case Range	This device control is used to override the transfer case range position.
Transfer Case Neutral Range Indicator	This function allows the technician to command the transfer case neutral range indicator, within the transfer case control switch, ON or OFF.

K71 Transmission Control Module: Scan Tool Information (10L1000 (MGM, MGU, MKM))

K71 Transmission Control Module — Scan Tool Parameter

Parameter	Expected Value	Units
Note: The following scan tool parameter values were taken from a normally operating vehicle. The parameter values on a different vehicle will vary slightly which depends on the following operating conditions: • Altitude • Ambient Air Temperature • Ambient Humidity • Engine Coolant Temperature **Operating Conditions:** Ignition= On— Accessories= Off		
Accelerator Pedal Position	Varies	%
Automatic Transmission Auxiliary Fluid Pump Command	On Off	—
Automatic Transmission Auxiliary Fluid Pump Control Circuit Low Test Status	Not RunorOkay	—
Automatic Transmission Auxiliary Fluid Pump Control Circuit Open Test Status	Not RunorOkay	—
Automatic Transmission Auxiliary Fluid Pump Control Circuit High Test Status	Not RunorOkay	—
Brake Pedal Position Switch	Brake Pedal Released= Released Brake Pedal Applied= Applied	—
Calculated Line Pressure	Ignition On - Engine Off= 550 /80 Ignition On - Engine Running= 550 /80 48 km/h (30 MPH) = 500 /73 80 km/h (50 MPH) = 524 /76	kPa / PSI
Calculated Throttle Position	0 km/h (0 MPH) = 0 48 km/h (30 MPH) = 10 80 km/h (50 MPH) = 13	%

Parameter	Expected Value	Units
Control Module Voltage Signal	Ignition On - Engine Off= 12.60 Ignition On - Engine Running= 14.40	V
Current Gear	P = Park R = Reverse N = Neutral D = 1–10 L = 1–10	—
Distance Since Diagnostic Trouble Code Cleared	Varies	km / mi
Driver Requested Axle Torque	Varies	N·m
Driver Shift Control Mode	S3 Transmission Shift Lever — P, R, N, D = Inactive S3 Transmission Shift Lever — L, M, S = Active	—
Electronic Transmission Range Select Actual Range	Park Neutral Low Neutral High Drive Reverse Neutral Shift	—
Engine Coolant Temperature	Ignition On - Engine Off= 41 /105 Ignition On - Engine Running= 52 /126 48 km/h (30 MPH) = 87 /189 80 km/h (50 MPH) = 94 /201	°C/°F
Engine Speed	Ignition On - Engine Off= 0 Ignition On - Engine Running= 582 48 km/h (30 MPH) = 1173 80 km/h (50 MPH) = 1277	RPM
Engine Torque	Ignition On - Engine Off= −41 /−30 Ignition On - Engine Running= 15 /11 48 km/h (30 MPH) = 58 /43 80 km/h (50 MPH) = 136 /100	N·m/lb ft
Gear Command	P = Park R = Reverse N = Neutral D = 1–10 L = 1–10	—
Gear Ratio	1 = 4.70:1 2 = 2.99:1 3 = 2.15:1 4 = 1.77:1 5 = 1.52:1 6 = 1.28:1 7 = 1.00:1 8 = 0.85:1 9 = 0.69:1 10 = 0.64:1 R = 4.87:1	—
High Side Driver Circuit High Test Status	Okay	—
High Side Driver Circuit Low Test Status	Okay	—
High Side Driver Circuit Open Test Status	Not Run	—

Parameter	Expected Value	Units
High Side Driver Command	Engine ≠Running= Disabled Engine — Running= Enabled	—
High Side Driver 2 Circuit High Test Status	Okay	—
High Side Driver 2 Circuit Low Test Status	Okay	—
High Side Driver 2 Circuit Open Test Status	Not Run	—
High Side Driver 2 Command	Engine ≠Running= Off Engine — Running= On	—
Ignition and Start Switch Accessory Signal	On	—
Ignition and Start Switch Signal	On	—
Ignition and Start Signal	Ignition On - Engine Off= 12.6 Ignition On - Engine Running= 14.4	V
Input Shaft Speed Sensor	Ignition On - Engine Off= 0 Ignition On - Engine Running= 551 48 km/h (30 MPH) = 1166 80 km/h (50 MPH) = 1184	RPM
Input Speed Sensor Direction	Forward Reverse	—
Input Speed Sensor Direction Signal	Forward= 0.05 Reverse= 0.18	ms
Intermediate Speed Sensor	0 km/h (0 MPH) = 0 48 km/h (30 MPH) = 1170 80 km/h (50 MPH) = 2754	RPM
Intermediate Speed Sensor Direction	Forward Reverse	—
Intermediate Speed Sensor Direction Signal	Forward= 0.05 Reverse= 0.18	ms
Intermediate Speed Sensor 2	0 km/h (0 MPH) = 0 48 km/h (30 MPH) = 1166 80 km/h (50 MPH) = 2754	RPM
Intermediate Speed Sensor 2 Direction	Forward Reverse	—
Intermediate Speed Sensor 2 Direction Signal	Forward= 0.05 Reverse= 0.18	ms
Last Shift Time	0.12	[s]
Output Shaft Speed Sensor	0 km/h (0 MPH) = 0 48 km/h (30 MPH) = 1159 80 km/h (50 MPH) = 1720	RPM
Output Speed Sensor Direction	Forward Reverse	—
Output Speed Sensor Direction Signal	Forward= 0.05 Reverse= 0.18	ms
Park System Status	P = Park R, N, D, L, S = Out of Park	—
Power Mode	Off Accessory Run Crank Request	—

Parameter	Expected Value	Units
Propulsion System Status	Engine Running= Active Engine Off= Inactive	Active
Shift Limiting Active Reason	None	—
Sensor Supply Circuit Status	Okay	—
Sensor Supply 2 Circuit Status	Okay	—
Torque Converter Clutch Pressure Command	0.00	kPa / PSI
Torque Converter Clutch Desired Slip Speed	0.0	RPM
Torque Converter Clutch Slip Speed	Ignition On - Engine Off= 0 Ignition On - Engine Running= 30 48 km/h (30 MPH) = 1 80 km/h (50 MPH) = 47	RPM
Tow/Haul Mode	Inactive Active	—
Transmission Clutch 1-6 Return Spring Learn Status	Inactive Learn Inhibited - Transmission Fluid Temperature Too Low Learn Inhibited - Transmission Fluid Temperature Too High Learn inhibited — malfunction present Learn Inhibited - Throttle Position/Engine Torque Unstable Learn Inhibited - Accelerator Pedal Angle Too Small Learn Inhibited - Accelerator Pedal Angle Too Large Learn Inhibited - Engine Speed Too Low Learn Inhibited - Engine Speed Too High Learn Inhibited - Rough Road Learn in Progress	—
Transmission Clutch 1-6 Return Spring Learn Required	Yes No	—
Transmission Clutch 1-6 Return Spring Learn Driving Maneuver Required	None 1-2 Upshift 2-3 Upshift 2-4 Upshift 3-4 Upshift 4-5 Upshift 5-6 Upshift 6-7 Upshift 7-8 Upshift 8-9 Upshift 9-10 Upshift 10-9 Downshift 9-8 Downshift 8-7 Downshift 7-6 Downshift 6-5 Downshift 5-4 Downshift 4-3 Downshift 3-2 Downshift 3-1 Downshift 2-1 Downshift	

Parameter	Expected Value	Units
	1st Gear 2nd Gear 3rd Gear 4th Gear 5th Gear 6th Gear 7th Gear 8th Gear 9th Gear 10th Gear	
Transmission Clutch 1-6 Return Spring Learn Progress Counter	Varies	Counts
Transmission Clutch 1-6 Volume Learn Status	Inactive Learn Inhibited - Transmission Fluid Temperature Too Low Learn Inhibited - Transmission Fluid Temperature Too High Learn inhibited — malfunction present Learn Inhibited - Throttle Position/Engine Torque Unstable Learn Inhibited - Accelerator Pedal Angle Too Small Learn Inhibited - Accelerator Pedal Angle Too Large Learn Inhibited - Engine Speed Too Low Learn Inhibited - Engine Speed Too High Learn Inhibited - Rough Road Learn in Progress	—
Transmission Clutch 1-6 Volume Learn Required	Yes No	—
Transmission Clutch 1-6 Volume Learn Progress Counter	Varies	Counts
Transmission Clutch 1-6 Volume Learn Driving Maneuver Required	None 1-2 Upshift 2-3 Upshift 2-4 Upshift 3-4 Upshift 4-5 Upshift 5-6 Upshift 6-7 Upshift 7-8 Upshift 8-9 Upshift 9-10 Upshift 10-9 Downshift 9-8 Downshift 8-7 Downshift 7-6 Downshift 6-5 Downshift 5-4 Downshift 4-3 Downshift 3-2 Downshift 3-1 Downshift 2-1 Downshift 1st Gear	—

Parameter	Expected Value	Units
	2nd Gear 3rd Gear 4th Gear 5th Gear 6th Gear 7th Gear 8th Gear 9th Gear 10th Gear	
Transmission Control Solenoid Valve 1–9 Calibration Data	Valid	—
Transmission Control Solenoid Valve 1-9 Control Circuit High Test Status	Not RunorOkay	—
Transmission Control Solenoid Valve 1-9 Control Circuit Low Test Status	Not RunorOK	—
Transmission Control Solenoid Valve 1–9 Control Circuit Open Test Status	Not RunorOkay	—
Transmission Control Solenoid Valve 1 Current	Ignition On - Engine Off= 0.75 Ignition On - Engine Running= 0.98 48 km/h (30 MPH) = 0.99 80 km/h (50 MPH) = 0.98	A
Transmission Control Solenoid Valve 1 Current Command	Ignition On - Engine Off= 0.76 Ignition On - Engine Running= 0.98 48 km/h (30 MPH) = 1.02 80 km/h (50 MPH) = 0.97	A
Transmission Control Solenoid Valve 1 Pressure Command	Ignition On - Engine Off= 0.00 /0.00 Ignition On - Engine Running= 136 /20 48 km/h (30 MPH) = 0.00 /0.00 80 km/h (50 MPH) = 0.00 /0.00	kPa / PSI
Transmission Control Solenoid Valve 2 Current	Ignition On - Engine Off= 0.82 Ignition On - Engine Running= 0.98 48 km/h (30 MPH) = 0.99 80 km/h (50 MPH) = 0.92	A
Transmission Control Solenoid Valve 2 Current Command	Ignition On - Engine Off= 0.83 Ignition On - Engine Running= 0.98 48 km/h (30 MPH) = 1.02 80 km/h (50 MPH) = 0.92	A
Transmission Control Solenoid Valve 2 Pressure Command	Ignition On - Engine Off= 0.00 /0.00 Ignition On - Engine Running= 2,206 /320 48 km/h (30 MPH) = 0.00 /0.00 80 km/h (50 MPH) = 2,206 /320	kPa / PSI
Transmission Control Solenoid Valve 3 Current	Ignition On - Engine Off= 0.75 Ignition On - Engine Running= 1.01 48 km/h (30 MPH) = 1.05 80 km/h (50 MPH) = 0.88	A
Transmission Control Solenoid Valve 3 Current Command	Ignition On - Engine Off= 0.76 Ignition On - Engine Running= 1.02 48 km/h (30 MPH) = 1.06 80 km/h (50 MPH) = 0.89	A

Parameter	Expected Value	Units
Transmission Control Solenoid Valve 3 Pressure Command	Ignition On - Engine Off= 0.00 /0.00 Ignition On - Engine Running= 0.00 /0.00 48 km/h (30 MPH) = 2,206 /320 80 km/h (50 MPH) = 2,206 /320	kPa / PSI
Transmission Control Solenoid Valve 4 Current	Ignition On - Engine Off= 1.20 Ignition On - Engine Running= 0.89 48 km/h (30 MPH) = 0.69 80 km/h (50 MPH) = 0.88	A
Transmission Control Solenoid Valve 4 Current Command	Ignition On - Engine Off= 1.20 Ignition On - Engine Running= 0.89 48 km/h (30 MPH) = 0.70 80 km/h (50 MPH) = 0.89	A
Transmission Control Solenoid Valve 4 Pressure Command	Ignition On - Engine Off= 0.00 /0.00 Ignition On - Engine Running= 0.00 /0.00 48 km/h (30 MPH) = 2,206 /320 80 km/h (50 MPH) = 173 /25	kPa / PSI
Transmission Control Solenoid Valve 5 Current	Ignition On - Engine Off= 0.04 Ignition On - Engine Running= 0.04 48 km/h (30 MPH) = 0.46 80 km/h (50 MPH) = 0.58	A
Transmission Control Solenoid Valve 5 Current Command	Ignition On - Engine Off= 0.04 Ignition On - Engine Running= 0.04 48 km/h (30 MPH) = 0.47 80 km/h (50 MPH) = 0.59	A
Transmission Control Solenoid Valve 5 Pressure Command	Ignition On - Engine Off= 0.00 /0.00 Ignition On - Engine Running= 0.00 /0.00 48 km/h (30 MPH) = 2,206 /320 80 km/h (50 MPH) = 173 /25	kPa / PSI
Transmission Control Solenoid Valve 6 Current	Ignition On - Engine Off= 0.57 Ignition On - Engine Running= 0.54 48 km/h (30 MPH) = 0.53 80 km/h (50 MPH) = 1.20	A
Transmission Control Solenoid Valve 6 Current Command	Ignition On - Engine Off= 0.57 Ignition On - Engine Running= 0.54 48 km/h (30 MPH) = 0.54 80 km/h (50 MPH) = 1.20	A
Transmission Control Solenoid Valve 6 Pressure Command	Ignition On - Engine Off= 0.00 /0.00 Ignition On - Engine Running= 2,206 /320 48 km/h (30 MPH) = 2,206 /320 80 km/h (50 MPH) = 2,206 /320	kPa / PSI
Transmission Control Solenoid Valve 7 Current	Ignition On - Engine Off= 0.01 Ignition On - Engine Running= 0.78 48 km/h (30 MPH) = 0.54 80 km/h (50 MPH) = 1.20	A
Transmission Control Solenoid Valve 7 Current Command	Ignition On - Engine Off= 0.01 Ignition On - Engine Running= 0.78 48 km/h (30 MPH) = 0.54 80 km/h (50 MPH) = 0.51	A

Parameter	Expected Value	Units
Transmission Control Solenoid Valve 8 Current	Ignition On - Engine Off= 0.00 Ignition On - Engine Running= 0.00 48 km/h (30 MPH) = 0.52 80 km/h (50 MPH) = 0.50	A
Transmission Control Solenoid Valve 8 Current Command	Ignition On - Engine Off= 0.00 Ignition On - Engine Running= 0.78 48 km/h (30 MPH) = 0.54 80 km/h (50 MPH) = 1.20	A
Transmission Control Solenoid Valve 9	OfforOn	—
Transmission Fluid Temperature Sensor	Ignition On - Engine Off= 33 /91 Ignition On - Engine Running= 42 /108 48 km/h (30 MPH) = 49 /120 80 km/h (50 MPH) = 63 /145	°C/°F
Transmission Hot Mode	No	—
Transmission Park Valve Lock Solenoid Actuator	Park= Off Out of Park= On	—
Transmission Park Valve Position Sensor	Park= 2.00 Out of Park= 0.80	V
Transmission Park Valve Position Sensor Status	Park Out of Park	—
Transmission Park Valve Position Sensor 2	Park= 0.80 Out of Park= 1.98	V
Transmission Park Valve Position Sensor 2 Status	Park Out of Park	—
Transmission Range Control Valve Position Sensor	Park= 0.80 Out of Park= 1.98	V
Transmission Range Control Valve Position Sensor Status	Park= Complete Out of Park= Failed	—
Transmission Range Sensor	P = 13 R = 47 N = 61 D = 75 L = 86	%
Transmission Range Sensor 2	P = 87 R = 53 N = 39 D = 25 L = 14	%
Up and Down Shift Switch	No Button Pressed= None Upshift» Pressed= Upshift Downshift» Pressed= Downshift	—
Vehicle Speed	Varies	km/h/MPH

Scan Tool Control Function

Control Function	Description
Automatic Transmission Auxiliary Fluid Pump	Overrides the state of the auxiliary transmission pump relay output
High Side Driver& High Side Driver 2	Overrides the state of the High Side Driver Output
Shift Transmission Gear	Overrides the commanded gear output
Torque Converter Clutch	Overrides the state of the Torque Converter Clutch Enable and/or Torque Converter Clutch Control Solenoid
Transmission Control Solenoid Valve 1–9	Overrides the state of the Transmission Control Solenoid Valve — On or Off
Transmission Control Solenoid Valve 1–8 Current	Overrides the current of the Transmission Control Solenoid Valve — 0–1.2 A

Configuration/Reset Functions

Control Function	Description
Transmission Adaptive Pressure Reset	Triggers the reset of the transmission adaptive parameters
Transmission Service Fast Learn	This test executes a procedure in the TCM software to re-learn a variety of inputs.
Vehicle Speed Detected When Park Range Selected Reset	Triggers the reset of the park at speed detection values

K73 Telematic Control Module: Scan Tool Information

Telematic Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
GPS Data			
• Dead Reckoning Calibration Status	—	Calibrated or Not Calibrated	Indicates the dead reckoning calibration status.
• Position Calibration Method	—	Varies	Indicates the method used to determine current location. (0) GPS, (1) Wheel Speed Dead Reckoning only, (2) Combined Wheel Speed and GPS, (3) Gyro only, (4) Combined Gyro and GPS, (5) No Fix
• Month	—	MM	This displays the current month.
• Day	—	DD	This displays the current day of the month.
• Year	—	YY	This displays the current year.
• Hour	—	HH	This displays the GPS current hour (24 hour format – GMT).
• Minute	—	MM	This displays the GPS current minute.
• Second	—	SS	This displays the GPS current second.
• Number of Satellites Tracked	—	Varies	The scan tool displays the number of satellites being tracked by the Telematic Control Module.
Signal Strength Data			
• GSM Signal Strength	—	Varies	The scan tool displays 0–127. This is the Telematic Control Module signal strength.

Parameter	System State	Expected Value	Description
• Current Public Land Mobile Network	—	Varies	Identifies the cellular communications network currently in use by the Telematic Control Module. Each network has a unique decimal number assigned to it for identification.
Bluetooth Data			
• Bluetooth	—	Enabled	Indicates if the Bluetooth system is enabled or disabled.
• Bluetooth Link Status	—	Varies	Indicates the current link status. (0) Unconnected, (1) Connected / Idle, (2) Call active, (3) 3-way calling active
• Bluetooth Link Quality	—	Varies	The scan tool displays a decimal value between 0 and 255.
• Bluetooth Phone to Telematic Control Module Authentication Status	—	Active or Inactive	Displays the bluetooth phone to Telematic Control Module authentication status.
• Bluetooth Phone to Telematic Control Module Communication Status	—	Active or Inactive	Displays the bluetooth phone to Telematic Control Module status.
• Bluetooth Phone Voice Recognition Status	—	Active or Inactive	Displays the bluetooth phone to voice recognition status.
WLAN Device Data			
Off-Board Navigation	—	Enabled or Disabled	Indicates if Off-Board Navigation is enabled or disabled
Wireless LAN	—	Enabled or Disabled	Indicates the capability of the wireless communication of the Telematic Control Module
Number of WLAN Devices	—	Varies	Indicates the number of Wireless devices present
Active WLAN 2.4GHz Chennel	—	Varies	Indicates the active Wireless channel being used on the 2.4 GHz frequency
WLAN Link Status	—	Radio System – Never, Remembered but Not Associated or Associated	Indicates the link status of the Telematic Control Module and Infotainment system
GSM Signal Strength	—	Varies	State for Received Signal Strength Indicator
Mobile Communication Standard	—	2G, 3G, 4G or 4G LTE	State for Cellular Data Connection. Indicates the currently used data rate speed
WLAN Password	—	Varies	Indicates the Telematic Control Module Wireless Password
WLAN SSID (Service Set Identifier)	—	Varies	Indicates the Telematic Control Module Wireless Service Name
WLAN Encryption – WPA (Wi–Fi Protected Access)	—	Active or Inactive	Indicates if the WLAN Encryption – WPA (Wi–Fi Protected Access) is Active or Inactive
WLAN Encryption – WPA2 (Wi–Fi Protected Access II)	—	Active or Inactive	Indicates if the WLAN Encryption – WPA2 (Wi–Fi Protected Access II) is Active or Inactive
WLAN Encryption – AES (Advanced Encryption Standard)	—	Active or Inactive	Indicates if the WLAN Encryption – AES (Advanced Encryption Standard) is Active or Inactive
WLAN Encryption – TKIP (Temporal Key Intergrity Protocol)	—	Active or Inactive	Indicates if the WLAN Encryption – TKIP (Temporal Key Integrity Protocol) is Active or Inactive

Telematic Control Module Scan Tool Output Controls

Output Control	Description
B1000 Information	This shows the data recorded when DTC B1000 was set in the Telematic Control Module.
Green Indicator	The Telematic Control Module illuminates the green LED when ON is selected.
Phone Call Test	When ON is selected, Telematic Control Module commands OnStar to connect to the OnStar Center.
Red Indicator	The Telematic Control Module illuminates the red LED when ON is selected.
Preferred Roaming List Update	The Telematic Control Module performs a preferred roaming list (PRL) update when this is selected.
Remote Vehicle Speed Limiting Reset	This function resets the speed limiting feature.

K85P Restraints Occupant Classification System Module - Passenger: Scan Tool Information

Restraint Occupant Classification System Module Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Base Model Part Number	Varies, 8 Digit Number	The scan tool displays the part number of the ROCSM which is stored in non volatile memory.
Battery Voltage	Volts	The scan tool will display battery voltage.
Calibration Part Number	Varies, 8 Digit Number	The scan tool displays the part number of the calibration file in the ROCSM.
End Model Part Number	Varies, 8 Digit Number	The scan tool displays the part number of the ROCSM in production.
Manufacturer's Traceability Number	Varies, 16 Digit Number	The scan tool displays the 16 digit traceability number in the ROCSM.
Passenger Air Bag Enable/Disable Request by Restraint Occupant Classification System Module	Disable	The scan tool displays the Passenger Air Bag Enable/ Disable Request by Restraint Occupant Classification System Module.
Restraint Occupant Classification Module Primary Key	Hex Value	The scan tool indicates the primary key Hex value.
Restraint Occupant Classification System Reporting DTC(s)	Yes/No	The ROCSM will report if there are DTCs set in the Restraint Occupant Classification module.
Passenger Seat Occupancy Status	Empty Seat	The scan tool displays Undefined, Empty Seat, Occupied, or Invalid. This is the state of the passenger seat if it is occupied or empty and monitored by the Restraint Occupant Classification System.
Power Mode	Off / Accessory / Run / Crank Request	The scan tool will display the power mode of the vehicle.
Primary Key Status	Valid/Invalid	The scan tool displays Valid if the primary key matches what is stored to memory in the ROCSM.
Received Primary Key	Hex Value	The scan tool displays a Hex value indicating the ROCSM received primary key data.
Software Part Number	Varies, 8 Digit Number	The scan tool displays the software part number in the ROCSM.

K182 Parking Assist Control Module: Scan Tool Information

Note: Due to software and hardware variations, not all information may be applicable.

Parking Assist Control Module Scan Tool Data Parameters – Identification Information

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Parking Assist ON			
Vehicle Identification Number (VIN)	—	Varies	The scan tool displays the Vehicle Identification Number
Diagnostic Data Identifier	—	Varies	The scan tool displays the Diagnostic Data Identifier
XML Configuration Compatibility Identifier	—	Varies	The scan tool displays the XML Configuration Compatibility Identifier
XML Data File Part Number	—	Varies	The scan tool displays the XML Data File Part Number
XML Data File Alpha Code	—	Varies	The scan tool displays the XML Data File Alpha Code
Module Diagnostic Address	—	Varies	The scan tool displays the Module Diagnostic Address
Manufacturer's Traceability Number	—	Varies	The scan tool displays the Manufacturer's Traceability Number
Software Part Number	—	Varies	The scan tool displays the Software Part Number
Calibration Part Number 2	—	Varies	The scan tool displays the Calibration Part Number 2
End Model Part Number	—	Varies	The scan tool displays the End Model Part Number
Base Model Part Number	—	Varies	The scan tool displays the Base Model Part Number
Software Module 1 Identifier Alpha Code	—	Varies	The scan tool displays the Software Module 1 Identifier Alpha Code
End Model Part Number Alpha Code	—	Varies	The scan tool displays the End Model Part Number Alpha Code
Base Model Part Number Alpha Code	—	Varies	The scan tool displays the Base Model Part Number Alpha Code
GMLAN Identification Data - Bus 1 Type	—	Varies	The scan tool displays the GMLAN Identification Data - Bus 1 Type
GMLAN Identification Data - Data Dictionary 1 Version	—	Varies	The scan tool displays the GMLAN Identification Data - Data Dictionary 1 Version
GMLAN Identification Data - GMLAN Kernel 1 Version	—	Varies	The scan tool displays the GMLAN Identification Data - GMLAN Kernel 1 Version
Date Programmed	—	Varies	The scan tool displays the date the module was programmed

Parking Assist Control Module Scan Tool Data Parameters – Park Assist System Data

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Parking Assist ON			
Power Mode	—	Run	The scan tool displays Off, Accessory, Run or Crank. This is the state of the ignition switch.
Battery Voltage	—	11–14 V	The scan tool displays V. This is the current battery voltage.
Parking Assist System Status	—	Enable	The scan tool displays Disable, Enable, Inhibited or Failed. This is the state of the parking assist system.
Parking Assist Chime	—	Varies	The scan tool displays On or Off. On is displayed if there is an object within the measuring range of the object sensors.
Parking Assist Sensors	—	ON	The scan tool displays On or Off.
Calculated Transmission Range	Transmission in reverse	Park	The scan tool displays Park, Reverse, Neutral, Drive or Unknown depending on the state of the commanded gear.

Parameter	System State	Expected Value	Description
Parking Assist Switch	—	Active/Inactive	The scan tool displays Active or Inactive depending on the state of the parking assist switch.
Advanced Parking Assist Switch	—	Active/Inactive	The scan tool displays Active or Inactive depending on the state of the advanced parking assist switch.
Parking Assist Sensors Reference Voltage	—	7.3–12.1 V	The scan tool displays V. This is the amount of voltage being sent to the object sensors.
Parking Assist Switch LED	—	Varies	The scan tool displays On or Off depending on the state of the parking assist switch LED.
Right Side Object Detection Indicator	—	Varies	The scan tool displays a blank, On or Off depending on the state of the right side object detection indicator command status.
Left Side Object Detection Indicator	—	Varies	The scan tool displays a blank, On or Off depending on the state of the left side object detection indicator command status.
Advanced Parking Assist Status	—	Standby	The scan tool displays Standby, Active, or Inactive depending on the state of the advanced parking assist.

Parking Assist Control Module Scan Tool Data Parameters – Parking Assist Sensor Data

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Parking Assist ON			
Parking Assist Sensors	—	ON	The scan tool displays On or Off.
Parking Assist Sensors Reference Voltage	—	7.3–12.1 V	The scan tool displays V. This is the voltage being sent to the object sensors.
Left Front Advanced Parking Assist Side Object Sensor	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Left Front Outer Object Sensor Distance to Object	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Left Front Inner Object Sensor Distance to Object	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Right Front Advanced Parking Assist Side Object Sensor	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Right Front Outer Object Sensor Distance to Object	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Right Front Inner Object Sensor Distance to Object	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Left Rear Advanced Parking Assist Side Object Sensor	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Left Rear Outer Object Sensor Distance to Object	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Left Rear Inner Object Sensor Distance to Object	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Right Rear Advanced Parking Assist Side Object Sensor	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.

Parameter	System State	Expected Value	Description
Right Rear Outer Object Sensor Distance to Object	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.
Right Rear Inner Object Sensor Distance to Object	—	32767 mm	The scan tool displays mm. This is the distance between the parking assist sensor and the nearest object.

Parking Assist Control Module Scan Tool Data Parameters – Parking Assist Disable History 1–4 Data

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Parking Assist ON			
Parking Assist Disable History 1	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 2	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 3	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 4	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.

Parking Assist Control Module Scan Tool Data Parameters – Parking Assist Disable History 5–7 Data

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Parking Assist ON			
Parking Assist Disable History 5	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.

Parameter	System State	Expected Value	Description
Parking Assist Disable History 6	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 7	—	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.

Parking Assist Control Module Scan Tool Output Controls

Output Control	Description
Park Assist Switch LED	The parking assist control module illuminates the advanced park assist LED of the when commanded from the scan tool.
Clear Disable History Data	The parking assist control module clears the Parking Assist Disable History data when commanded from the scan tool.
Clear Side Object Detection Disable History	The parking assist control module clears the Side Object Detection Disable History data when commanded from the scan tool.
CAN Bus Configuration Learn	The parking assist control module learns the CAN Bus configuration when commanded from the scan tool.
Parking Assist Sensor Learn	The parking assist control module learns the Parking Assist Sensor configuration when commanded from the scan tool.

K194 Rear Gate Module: Scan Tool Information

Rear Gate Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			
Rear Closure	—	Inactive/Active	Displays active when the power endgate is operating.
Rear Gate Latch Unlatch Switch	—	Inactive/Active	Inactive when endgate is closed. Changes to active once the endgate opens.
Rear Gate Latch Primary Switch	—	Inactive/Active	Inactive when endgate is closed. Changes to active as soon as the endgate unlatches.
Rear Gate Latch Neutral Switch	—	Inactive/Active	Inactive when endgate is closed. Changes briefly to active once endgate unlatches then goes back to inactive.
Rear Gate Travel	—	Percentage	Calculated percentage of endgate travel. 0% = Full Close, 100% = Full Open.
Rear Gate Obstacle Detection Zone 1	—	Counts	Displays a counter for each fault detection zone, if an obstruction or excessive resistance is seen by the RGM while power opening or closing the count number will go up for the respective detection zone.
Rear Gate Obstacle Detection Zone 2	—	Counts	Displays a counter for each fault detection zone, if an obstruction or excessive resistance is seen by the RGM while power opening or closing the count number will go up for the respective detection zone.
Rear Gate Obstacle Detection Zone 3	—	Counts	Displays a counter for each fault detection zone, if an obstruction or excessive resistance is seen by the RGM while power opening or closing the count number will go up for the respective detection zone.

Parameter	System State	Expected Value	Definition
Rear Gate Obstacle Detection Zone 4	—	Counts	Displays a counter for each fault detection zone, if an obstruction or excessive resistance is seen by the RGM while power opening or closing the count number will go up for the respective detection zone.
Rear Gate Obstacle Detection Zone 5	—	Counts	Displays a counter for each fault detection zone, if an obstruction or excessive resistance is seen by the RGM while power opening or closing the count number will go up for the respective detection zone.
Rear Gate Obstacle Detection Zone 6	—	Counts	Displays a counter for each fault detection zone, if an obstruction or excessive resistance is seen by the RGM while power opening or closing the count number will go up for the respective detection zone.
Rear Gate Obstacle Detection Zone 7	—	Counts	Displays a counter for each fault detection zone, if an obstruction or excessive resistance is seen by the RGM while power opening or closing the count number will go up for the respective detection zone.
Rear Gate Latch Secondary Switch - Left	—	Inactive/Active	Inactive when endgate is closed. Changes to active as soon as the endgate unlatches.
Rear Gate Latch Secondary Switch - Right	—	Inactive/Active	Inactive when endgate is closed. Changes to active as soon as the endgate unlatches.
Rear Gate Latch Primary Switch - Right	—	Inactive/Active	Inactive when endgate is closed. Changes to active as soon as the endgate unlatches.
Rear Gate Latch Unlatch Switch - Right	—	Inactive/Active	Inactive when endgate is closed. Changes to active once the endgate opens.
Rear Gate Latch Neutral Switch - Left	—	Inactive/Active	Inactive when endgate is closed. Changes briefly to active once endgate unlatches then goes back to inactive.

P16 Instrument Panel Cluster Control Module: Scan Tool Information

Instrument Cluster Scan Tool Data Parameters

Parameter	Expected Value	Description
Operating Conditions: Ignition ON		
Battery Voltage	12–14 V	The scan tool displays Volts. This is the current battery voltage signal.
Key in Ignition Status	Active/Inactive	The scan tool displays Active or Inactive. This is the state of the key in ignition switch.
Driver Information Center Switch	Varies	The scan tool displays Volts. This is the current driver information center switch input voltage.
Driver Information Center Switch	Inactive	The scan tool displays either Inactive, Up, Down, or Menu. This is the state of the driver information center switch.
Reset Switch	Active/Inactive	The scan tool displays Active or Inactive. This is the state of the reset switch.
Ambient Air Temperature	15°C	The scan tool displays outside temperature in °C.
Washer Fluid Level Switch	Open	The scan tool displays either Open, Closed, or Not Available.
Odometer Lock Status	Active/Inactive	The scan tool displays Active or Inactive depending on the state of the odometer.
Engine Speed	0 RPM	The scan tool displays the filtered value of engine speed.
Vehicle Speed	0 km/h	The scan tool displays the filtered vehicle speed value.
Fuel Level Sensor	—	The scan tool displays the filtered value of the fuel level.
Engine Coolant Temperature	—	The scan tool displays the filtered value of the engine coolant temperature.

Parameter	Expected Value	Description
Engine Oil Pressure	—	The scan tool displays the filtered value of the engine oil pressure.
Head-Up Display Dimming Level	percentage	The scan tool displays the current dimming intensity level.
Head-Up Display Switch	Head-Up Display Movement, Head Up Page Switch, Head-Up Display Dimming Level	The scan tool displays the current HUD button being pushed.
Steering Wheel Control Switches	Left, Select, Right , Volume UP, Volume Down	The scan tool displays the current steering wheel controls button being pushed.

Instrument Cluster Scan Tool Output Controls

Output Control	Description
Instrument Cluster Gauge Sweep	This function is used to command the gauges to sweep from minimum to maximum.
Driver Information Center Dimming	This function is used to command the dimming of the driver information display to Increase or Decrease by 10%.
Instrument Panel Dimmer Switch	This function is used to command the dimming of the instrument cluster to Increase or Decrease by 10%.
Driver Information Center Segments	This function is used to command the driver information center segments ON and OFF.
All Indicators	This function is used to command all the indicators ON or OFF.
Driver Information Center Options	This function is used to command the driver information center buttons using the scan tool.
CAN Bus Configuration Learn	This function is used to Reset the source ID for low speed CAN Bus communications.
Head Up Display Dimming Level	This function is used to command the dimming of the head up display to Increase or Decrease.
Head Up Display Pattern Check	This function is used to command the head up display to display a striped test pattern.

T3 Audio Amplifier: Scan Tool Information

Amplifier Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Power Mode	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the vehicle power mode status as received via serial data.
Active Noise Cancellation	On	The scan tool displays On or Off. This indicates if the Active Noise Cancellation feature is available and capable of operating.
Engine Speed Signal	Normal	The scan tool displays Normal or Malfunction. This is the status of the dedicated engine speed signal circuit.
Battery Voltage	Varies	The scan tool displays volts. This is the voltage at the input to the amplifier.
Vehicle Speed	0 km/h	The scan tool displays the vehicle speed received by the amplifier in km/h or mph.
Engine Speed	0 RPM	The scan tool displays the current engine speed received by the amplifier in RPM .
Calculated System Temperature	Varies	The scan tool displays the calculated temperature of the amplifier in °C or °F.
Active Noise Cancellation Speaker Output	OK	The scan tool displays OK or Malfunction. This is the status of the amplifier speaker outputs.

Parameter	Expected Value	Definition
Cylinder Deactivation System Command	Varies	The scan tool displays 8 Cylinder Active, Transitioning from 8 to 4, 4 Cylinder Active, Transitioning from 4 to 8, or Malfunction. This is the status of the cylinder deactivation mode as received via serial data. Malfunction is displayed when this data is not being received, or when the engine is not running.
Microphone Status	Normal	The scan tool displays Normal, Clipped, or Malfunction.
Microphone 1 Input Level	Varies	The scan tool displays counts from 0 to 65,535. This is the sound level currently being received by the microphone 1, with higher numbers indicating louder sounds.
Microphone 2 Input Level	Varies	The scan tool displays counts from 0 to 65,535. This is the sound level currently being received by the microphone 2, with higher numbers indicating louder sounds.
Microphone 3 Input Level	Varies	The scan tool displays counts from 0 to 65,535. This is the sound level currently being received by the microphone 3, with higher numbers indicating louder sounds.
Door Status	Varies	The scan tool displays All Closed or One or More Open. This is the current status of the vehicle access door latches as received via serial data.
Folding Top Status	Varies	The scan tool displays Closed, Open, Malfunction, or Normal. This is the current position of the vehicle folding top (if equipped) as received via serial data.
Calibration Part Number 1	Varies	The scan tool displays the software calibration part number 1.
Calibration Part Number 2	Varies	The scan tool displays the software calibration part number 2.
Calibration Part Number 3	Varies	The scan tool displays the software calibration part number 3.
Calibration Part Number 4	Varies	The scan tool displays the software calibration part number 4.
Calibration Part Number 5	Varies	The scan tool displays the software calibration part number 5.
Calibration Part Number 6	Varies	The scan tool displays the software calibration part number 6.
Calibration Part Number 7	Varies	The scan tool displays the software calibration part number 7.
Calibration Part Number 8	Varies	The scan tool displays the software calibration part number 8.
Calibration Part Number 9	Varies	The scan tool displays the software calibration part number 9.
Calibration Part Number 10	Varies	The scan tool displays the software calibration part number 10.
End Model Part Number	Varies	The scan tool displays the end software module part number.
Diagnostic Data Identifier	Varies	Identifies a supplier and system specific data stream used by diagnostic testers to interpret a diagnostic data stream.

T22 Wireless Accessory Charging Module: Scan Tool Information

The T22 Wireless Accessory Charging Module scan tool data parameters list contains all automatic level control related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists.

Wireless Accessory Charging Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description (Range)
Operating Conditions: Ignition ON			
Alignment Status	—	Varies	The scan tool displays the current condition of Radar Alignment.
Charging Current Level	—	Varies	The scan tool displays the state or energy level of charging device being energized by inductive charging coil located under the cup holder (None, Low, Medium, High).

Parameter	System State	Expected Value	Description (Range)
Charging Current Value	—	Varies	The scan tool displays the current in mA being energized by inductive charging coil located under cup holder (0–1000mA).
Wireless Charging Disable History - 1	—	Varies	Indicates why the wireless charging system was disabled.
Wireless Charging Disable History - 2	—	Varies	Indicates why the wireless charging system was disabled.
Wireless Charging Disable History - 3	—	Varies	Indicates why the wireless charging system was disabled.
Wireless Charging Disable History - 4	—	Varies	Indicates why the wireless charging system was disabled.
Wireless Charging Disable History - 5	—	Varies	Indicates why the wireless charging system was disabled.
Wireless Charging Disable History - 6	—	Varies	Indicates why the wireless charging system was disabled.
Wireless Charging Disable History - 7	—	Varies	Indicates why the wireless charging system was disabled.
Wireless Charging Disable History - 8	—	Varies	Indicates why the wireless charging system was disabled.

K111 Fuel Pump Power Control Module Scan Tool Information

Refer to: *K20 Engine Control Module: Scan Tool Information (L5P) 3-105* *K20 Engine Control Module: Scan Tool Information (L8T) 3-153*.

Diagnostic Information and Procedures

Strategy Based Diagnosis

The goal of Strategy Based Diagnosis is to provide guidance when you create a plan of action for each specific diagnostic situation. Following a similar plan for each diagnostic situation, you will achieve maximum efficiency when you diagnose and repair vehicles. Although each of the Strategy Based Diagnosis steps are numbered, you are not required to complete every step in order to successfully diagnose a customer concern. The first step of your diagnostic process should always be Understand and Verify the Customer's Concern. The final step of your diagnostic process should be to Repair and verify the Fix. Refer to the steps listed below for the correct Strategy Based Diagnosis.

Note: For additional information on the following steps refer to the corresponding numbered paragraphs listed below.

1. Understand and verify the customers concern.
2. Verify the vehicle is not operating as designed:

⇒ **If the vehicle is operating as designed review the suggestions listed below:**

- Check Identical Vehicle
- Customer Misunderstanding of System – Explain operation to customer or refer to owners or service manual
- Customer dissatisfaction – Submit a Field Product Report

⇓ **If the vehicle is not operating as designed**

3. Perform preliminary checks – Visual inspections and operational

⇒ **If the customers concern is found, refer to step 5**

⇓ **If the customers concern is not found**

4. Perform the Diagnostic System Check – Vehicle, determine the diagnostic service category to perform.

⇒ **If the customers concern is found, refer to step 5**

⇓ **If the customers concern is not found**

5. Check for related Bulletins, Recalls and Preliminary Information.

⇒ **If the customers concern is found, refer to step 7**

⇓ **If the customers concern is not found**

Note: If a diagnostic procedure indicates to replace a programmable control module, the control module must be reprogrammed with the latest available software and retested before replacement:

- If updated control module software is available, reprogram the control module and re-test to verify if updated software has corrected the concern. If the updated software has corrected the concern, no further action is required; Do not replace the control module. If the concern persists after programming the control module with the latest software, continue following the diagnostic instructions and replace the control module.

- If updated control module software is not available, continue following the diagnostic instructions and replace the control module if instructed.
- If the scan tool is unable to communicate with the suspected control module, attempt to reestablish communication by removing and reconnecting power to the control module. This may be performed by removing the fuse or fuses powering the control module or by disconnecting the electrical connector(s) at the control module. If communication with the control module is reestablished after removing and reconnecting power, reprogram the control module with the latest software (if available) and re-examine the concern.

6. Follow the diagnostic path listed below:
    - 6.1. Current DTC – Follow DTC Diagnostics
    - 6.2. Symptom no DTC – Follow Symptom Diagnostics
    - 6.3. No published diagnostic – Analyze and develop diagnostics or call Technical Assistance
    - 6.4. Intermittent/History DTC – See diagnostic detail below
7. Isolate the root cause then repair and verify the fix.
8. Re-examine the concern.

⇒ **If the vehicle is not repaired, refer to step 1**

⇓ **If the vehicle is repaired**

9. All OK.

Additional Information

1. Understand and Verify the Customer Concern: The first part of this step is to obtain as much information as possible from the customer. Are there aftermarket accessories on the vehicle? When does the condition occur? Where does the condition occur? How long does the condition last? How often does the condition occur? In order to verify the concern, the technician should be familiar with the normal operation of the system and refer to the owner or service manual for any information needed.
2. Vehicle Operating as Designed: This condition exists when the vehicle is found to operate normally. The condition described by the customer may be normal. Compare with another like vehicle that is operating normally under the same conditions described by the customer. Explain your findings and the operation of the system to the customer. If the customer is dissatisfied submit a Field Product Report.
3. Preliminary Checks: Conduct a thorough visual inspection. Review the service history. Detect unusual sounds or odors. Gather diagnostic trouble code (DTC) information in order to achieve an effective repair.
4. Perform Published Diagnostic System Check-Vehicle: The *Diagnostic System Check - Vehicle 3-255* verifies the proper operation of the system. This will lead the technician in an organized approach to diagnostics and identify what category of diagnostic to perform.
5. Check for related Bulletins, Recalls and Preliminary Information (PI).

Note: When diagnosing DTCs and symptoms that involve an control module, updated software may be available. Before replacing an control module, first determine if any software updates are available. If new software is available, reprogram the control module and reevaluate the concern. In many instances, reprogramming the control module with the latest software may correct a software-related fault and resolve the concern without replacement of the control module.

6. Diagnostic categories:
    - 6.1. Current DTC: Follow the designated DTC diagnostic in order to make an effective repair. Refer to *Diagnostic Trouble Code (DTC) List - Vehicle 3-260*.
    - 6.2. Symptom - No DTC: Select the appropriate symptom diagnostic. Follow the diagnostic steps or suggestions in order to complete the repair. Refer to *Symptoms - Vehicle 3-318*.
    - 6.3. No Published Diagnostics: Analyze the Concern. Develop a plan for the diagnostics. The service manual schematics will help you to see system power, ground, input, and output circuits. You can also identify splices and other areas where multiple circuits are tied together. Look at component locations to see if components, connectors or harnesses may be exposed to extreme temperature, moisture, or corrosives (road salt, battery acid, oil or other fluids). Utilize the wiring diagrams, system description and operation, and system circuit description.
    - 6.4. Intermittent/History DTC: An intermittent condition is one that does not occur continuously, may be difficult to duplicate, and will only occur when certain conditions are met. Generally, an intermittent is caused by faulty electrical connections and wiring, malfunc-

tioning components, electromagnetic/radio frequency interference, driving conditions, or aftermarket equipment. The following approaches/tools may prove to be beneficial in locating and repairing an intermittent condition or history DTC.

- Combining technicians knowledge with the available service information.
- Evaluate the symptoms and conditions described by the customer.

  North America – The GM Customer Concern Verification Sheets have been designed to improve communications between the service customer and the technician. The more clearly the technician understands the concern and its symptoms, the more likely the concern will be fixed right the first time. The blank CCVS can be found in GM Global Connect under Service, Service Forms.
- Follow the suggestions on [Link target (target-id 62112-) not found] .
- Use a tool with data capturing capabilities like scan tool, digital multi-meter, or (if available) a vehicle data recorder.

7. Isolate the Root Cause then Repair and Verify Fix: After isolating the root cause, make the repairs and validate for the correct operation by performing the *Diagnostic Repair Verification 3-319*. Verifying that the DTC or symptom has been corrected may involve road testing the vehicle.
8. Re-examine the Concern: If a technician cannot successfully find or isolate the concern, a re-evaluation is necessary. Re-verify the concern. The concern could be an intermittent or normal condition.

Diagnostic Procedure Instructions

The following is an instructional overview of all categories which may be included in a diagnostic procedure.

Diagnostic Instructions

- A link to the *Diagnostic System Check - Vehicle 3-255* is provided here. This procedure should be performed prior to performing other diagnostic procedures, as this prevents misdiagnosis where there are integrated system dependencies.
- A link to the *Strategy Based Diagnosis 3-245* is provided here. This provides an overview on how a technician should diagnose a vehicle.
- A link to the *Diagnostic Procedure Instructions 3-247* is provided here. This information is an instructional overview of all categories which may be included in a diagnostic procedure.

DTC Descriptor

Lists all DTCs and descriptors that are diagnosed within the procedure.

If the DTC supports symptom bytes they will either be listed with the DTC or there will be a link to the symptom byte list.

Diagnostic Fault Information

The Diagnostic Fault Information table identifies each circuit that makes up an electrical subsystem and the associated circuit faults. DTCs and symptoms are listed in the table for all circuit fault modes. This information can be used to diagnose an electrical fault, or as a quick visual aid showing how the different DTCs and symptoms apply for the subsystem being diagnosed.

All DTCs and symptoms shown in this table are not necessarily diagnosed during this procedure.

An example table from an engine coolant temperature (ECT) procedure:

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	P0117	P0118, P0119	P0118*, P0119	P0128, P111E
Low Reference	—	P0118, P0119	—	P0128
* Internal control module or component damage may occur if the circuit shorts to B+.				

Typical Scan Tool Data

The Typical Scan Tool Data table identifies a scan tool data parameter and its value in reference to potential circuit faults.

An example table from an ECT procedure:

ECT Sensor

Circuit	Short to Ground	Open	Short to Voltage
Operating Conditions: Engine = Idling— At normal operating temperature. **Parameter Normal Range:** 88 to 105°C (190 to 221°F)			
Signal	140°C (248°F)	−40°C (−40°F)	−40°C (−40°F)
Low Reference	—	−40°C (−40°F)	—

Circuit/System Description

Circuit/System Description identifies circuits, components, and describes how the circuit/system normally functions.

Conditions for Running the DTC

Conditions for Running the DTC, identifies what conditions must be present to allow the diagnostic to run.

Conditions for Setting the DTC

Conditions for Setting the DTC, identifies the conditions that must be present in order to fail the diagnostic and when to set the DTC.

Actions Taken When the DTC Sets

Actions Taken When the DTC sets, identifies the default actions taken when a control module sets a DTC.

Conditions for Clearing the DTC

Conditions for Clearing the DTC, identifies the conditions that must be met in order to clear the DTC.

Diagnostic Aids

Diagnostic Aids are suggestions which explain other methods to diagnose the condition. It also provides unique information about the system to assist the technician in finding and repairing a vehicle condition.

Reference Information

Reference Information includes links providing additional information to be used with the diagnostic procedure.

For example:

- Schematic Reference
- Connector End View Reference
- Component View Reference
- Description and Operation
- Electrical Information Reference
- DTC Type Reference
- Scan Tool Reference
- Special Tools

Circuit/System Verification

The Circuit/System Verification, when supported, needs to be performed prior to the Circuit/System Testing. It will determine the following conditions:

- If a higher priority concern needs to be addressed first (E.g. other DTCs)
- If other conditions are present (E.g. low fluid level)
- If the condition is current
- If the condition is intermittent
- If the system is all Ok

Note: Any diagnostic step that asks if a DTC is “set” refers to a Set, Current, Present, Active DTC status. This does not include any other DTC status. For example History, Not Run, Passed and Failed.

Circuit/System Verification is a non-intrusive procedure outlining how to verify that a system or a portion of a system is functioning correctly. During the verification process, the vehicle is kept intact and tested as a complete system. The verification is used to assist the technician in determining whether a condition is current, intermittent, or not present (All Ok). When a condition is determined to be intermittent a technician can use the [Link target (target-id 62112-) not found] link in Electrical Information Reference for additional testing information.

The technician should be able to identify if the fault is occurring on the input (signal) circuit or on the output (control) circuit when applicable.

Component Codes
The component codes are a language independent method of identifying a common component between different areas in the service information. The component codes work regardless on how the actual component name was translated.

The component codes used on the schematics will have the base code with an extension to identify location or quantity. For example the ABS wheel speed sensors are identified on the schematic with a base code (B5) and a location extension (LF, RF, LR, and RR) as seen below:

- B5LF Wheel Speed Sensor - Left Front
- B5RF Wheel Speed Sensor - Right Front
- B5LR Wheel Speed Sensor - Left Rear
- B5LR Wheel Speed Sensor - Left Rear

The diagnostic procedures will use the base code (B5) for a wheel speed sensor but may or may not use the extension identifying location (LF, RF, LR, and RR).

Example:
Disconnect the harness connector at the appropriate B5 Wheel Speed Sensor.

Or

Disconnect the appropriate electrical connector: B5 Wheel Speed Sensor

This is done so the diagnostic procedure can be common for all four wheel speed sensors and not have to take into account part location or quantity.

When the diagnostic states “the appropriate” it is up to the technician to identify which component is being diagnosed either by the symptom (Driver’s door lock is inoperative) or the DTC descriptor (DTC C0585 04: Left Rear Door Latch Circuit Open).

Circuit/System Testing

Note: Performing the Circuit/System Verification category first will aid in determining if a vehicle condition currently exists.

Circuit/System Testing is a step by step, positive-flow, testing sequence which allows the technician to perform each test step, in sequence, until a fault is detected. If the result of a numbered test step is NOT achieved, the Right Repair Arrow below the failed test will identify what actions need to take place. If the result of a numbered test step is achieved, the normal flow is to proceed to the next numbered test step, as indicated by the Down Pass Arrow.

Intrusive diagnostics are performed to locate the system fault. System harness connections are disconnected from the component or control module to test individual circuit functions. The component or control module will be used to assist in verifying the circuit function. When a test does not pass, the repair steps (Right Repair Arrow) will indicate what circuit faults to test. For example a short to voltage, short to ground, or open/high resistance.

When testing for individual circuit faults, the technician is expected to perform terminal inspections such as connection surfaces and terminal tension at both the harness and the component or control module. When a condition is determined to be intermittent a technician can use the [Link target (target-id 62112-) not found] or [Link target (target-id 62194-) not found] link in Electrical Information Reference for additional information.

The component and control module will also be diagnosed during the test steps. A retest of a component or control module should always be performed before replacement. For example, reconnect all components and control modules and retest the system to verify the condition still exists before replacing components or control modules.

Component Testing

Component Testing may offer a static and/or dynamic component tests. These tests can be used to verify if a component is operating correctly to avoid unnecessary replacement.

Testing control modules in this category will not be offered. In most cases, the control module is used to verify the harness circuits in the Circuit/System Testing category and a retest of the control module should always be performed before replacement.

Repair Instructions

Repair Instructions provides a link to *Diagnostic Repair Verification 3-319*. This link describes how to verify the vehicle is repaired.

All links to repair, replacement, or programming procedures are located here.

Repair Verification

Repair Verification describes how to verify the vehicle is repaired when additional instructions are needed beyond what is in the Diagnostic Repair Verification.

Diagnostic System Check Instructions

The following is an overview of instructions for the general information and 14 step System Verification included in the Diagnostic System Check - Vehicle procedure.

Diagnostic Instructions

A link to *Strategy Based Diagnosis 3-245* is provided as an overview on how a technician should diagnose a vehicle.

A link to the Diagnostic System Check Instructions is provided. This provides an overview of instructions and examples for the general information and 14 step System Verification included in the Diagnostic System Check - Vehicle procedure. The examples in this document are intended to give the technician a general idea of what the test step is referring to. They are not intended to list every possible condition or situation.

Diagnostic Systems Check steps are listed by priority to guide the technician to the appropriate diagnostic procedure to correct the customer concern. There are many ways to determine the priority of diagnosing a vehicle concern. Some faults can cause customer perceived symptoms in areas unrelated to the fault. Using an example from the System Check, after reading DTCs, the technician is asked to verify there are no Electronic Control Unit Internal Performance Faults present. It is important that any internal performance issues are addressed prior to continuing through the System Check. There is no benefit addressing other DTCs that could be set due to an internal fault to a control module. If the fault is present, performing the diagnostic procedure for that fault will likely correct the customer perceived concern and possibly eliminate other DTCs that may be set.

Not all steps of the Diagnostic System Check have to be performed. The Diagnostic System Check tries to prioritize the test steps with the highest priority faults first. The technician is then lead to another document to do the actual diagnosis or repair. The strategy is to repair higher level faults that may be the cause of other system or component level symptoms. Additionally, the Diagnostic System Check can only be used for a single fault at a time. If additional faults are present, the technician must perform the diagnostic system check for each concern until all customer concerns are corrected.

Once a repair has been completed, General Motors diagnostic strategy is to always have the technician verify that the customer concern has been corrected. This is to prevent comebacks and to ensure customer satisfaction with their dealership experience. Therefore a link has been provided to *Diagnostic Repair Verification 3-319* procedure for the technician to verify the customer concern has been corrected.

There are some assumptions made when General Motors prepares service information. They include the following areas which are presumed to function as designed:

- The 12-volt battery is fully charged. General Motors assumes the majority of vehicles brought in for repair will be able to start and be driven into the service stall. If the vehicle has a dead battery, it is slow cranking or for any other reason the technician feels the customer concern may be battery related, a link is provided to [Link target (target-id 37781-) not found] . This procedure will guide the technician through inspecting and verifying the battery functions properly.
- Fuses should not be open. General Motors does not call out in diagnostic procedures to verify a fuse. The technician is expected to find an open fuse when the diagnostic test step states to check for an open circuit condition. Therefore a link has been provided to *Power Distribution Schematics 8-789* and *Electrical Center Identification Views 8-30* for technicians to reference power sources and fuse locations if they feel there may be loss of power due to an open fuse condition.
- Ground circuits are clean, tight, and in the correct location. General Motors assumes that the original ground circuits have not been compromised. The technician is expected to find a poor ground connection when the diagnostic test step states to test the ground circuit for an open/high resistance. Therefore a link has been provided to *Ground Distribution Schematics 8-829* and *Harness Routing Views 8-632* for technicians to reference ground locations and which ground circuits may be related to the customer concern.
- All connectors/terminals fully seated in the area of concern. General Motors assumes that all connections are properly installed. The technician is expected to find an open or poor connection when the diagnostic test step asks to test the circuit for an open/high resistance. Therefore a link has been provided to *Master Electrical Component List 8-855* for technicians to reference which connections may be related to the customer concern.
- There are no aftermarket devices that affect the operation of the system. General Motors can only author diagnostic and repair information for vehicle systems and components that are original equipment or genuine GM Accessories. Aftermarket equipment can negatively affect original equipment operation and lead a technician's diagnosis of a concern in the wrong direction. Therefore a link has been provided to [Link target (target-id 310488-) not found] that guides a technician through the possible causes of vehicle problems related to aftermarket accessories.
- The scan tool powers up. General Motors assumes that power is available at the Data Link Connector and the scan tool will power on. Therefore a link has been provided to [Link target (target-id 148078-) not found] if the technician finds that the scan tool does not power on.

Updating Control Module Software

Control module software is an integral part of the operation and function of the control module. More than just the physical component, numerous corrections and enhancements can be changed in the software that will resolve many different faults. Service Information generally uses the term “software” as an indicator of a portion of the control module soft part that can be changed or updated; More specifically, this may be a boot loader, firmware, software, calibration, or other soft part.

As an overall strategy, reprogramming a control module with the most up-to-date software available is the correct diagnostic operation before replacing the control module. If a diagnostic procedure instructs to replace a control module, first determine if updated software is available. If it is, reprogram the control module with the latest software and retest the vehicle to determine if the fault is still present. Simply updating the software in a control module may resolve the concern without the cost or labor of replacing the control module. If programming the control module with the latest software corrects the concern, take no further action. If new software does not resolve the concern or if the control module already has the latest and most up-to-date software, continue with the corrective action identified in the diagnostic procedure.

Diagnostic System Check

1. VERIFY CUSTOMER CONCERN — This step is to obtain as much information as possible from the customer. Are there aftermarket accessories on the vehicle? When does the condition occur? Where does the condition occur? How long does the condition last? How often does the condition occur? Review the service history of the vehicle for previous repairs that could help diagnose the current concern.

   Now that the technician understands the customer concern, they should validate the concern on the vehicle. In order to verify the concern, the technician should be familiar with the normal operation of the system and refer to the owner or service manual for any information needed. Inspect the visible system components for obvious damage or conditions that could cause the concern. Conduct a thorough visual inspection. Detect unusual sounds or odors.

   The condition described by the customer may be normal. If the technician finds the vehicle to operate normally, compare with another like vehicle that is operating normally, under the same conditions described by the customer. If this is the case, explain your findings and the operation of the system to the customer. If the customer is dissatisfied, submit a Field Product Report.

2. BULLETIN SEARCH — By searching for related bulletins, recall/field actions and preliminary information documents, a procedure for a known field issue may resolve the customer concern with little or no diagnosis necessary saving the technician diagnostic time.

3. MECHANICAL CONCERNS — This step is designed to take the technician directly to a list of symptom diagnostic procedures. The technician is asked to verify the symptoms exhibited by the system are mechanical in nature and not related to an electrical system, see some examples below. If the technician feels the concern could be related to an electrical system, they should continue through the Diagnostic System Check to verify the electrical functionality of vehicle. If the technician feels the concern is exclusively related to a mechanical system, a link to *Symptoms - Vehicle 3-318* is provided to select the appropriate symptom diagnostic procedure for the customer concern.

   Examples:

   - Brake noise or diagnosing irregular pad wear
   - Water leak diagnosis
   - Engine or transmission fluid leak diagnosis
   - Manual window or door lock diagnosis
   - Vehicle vibration diagnosis
   - Exhaust noise or leak diagnosis

4. VEHICLE POWER UP VERIFICATION — The technician is asked in this step to verify the vehicle powers up. The technician should look for clues that multiple vehicle systems are receiving vehicle power mode messages, such as the cluster waking up, the radio powers on, the HVAC blower is operational, windshield wipers turn on, etc, with the ignition On. This would be a rare condition as both the power mode master and back-up power mode master would have to be inoperable, however, if the vehicle does not power up, a link to [Link target (target-id 148321-) not found] is provided.

5. CONTROL MODULE COMMUNICATION and DTC CHECK — The technician is asked in this step to record the following three pieces of data on the Repair Order; any control module that the scan tool determined is not communicating, any DTC and symptom byte set current or history, and the control module that has set the DTC.

   This is considered a setup step for the rest of the Diagnostic System Check. The technician is not expected to do anything other than record the three pieces of data provided by the scan tool on the Repair Order. This provides the information needed to complete the rest of the diagnostic system check.

To complete this step, the technician is asked to utilize the scan tool Vehicle DTC Information function. This function will query every possible control module on the vehicle requesting all DTCs. During the DTC query, the scan tool will try to establish communication with each control module. If the scan tool can communicate with the control module during the DTC request, it will display PRESENT and provide the number of DTCs set in the control module. If the scan tool cannot communicate with a control module, it will only display NOT COMMUNICATING. Since the scan tool cannot determine if a given control module should be present or not, the technician is asked in a future step to verify that the vehicle was not built with control modules listed as NOT COMMUNICATING.

If the scan tool cannot establish communications with ALL of the vehicles control modules, a link to [Link target (target-id 148085-) not found] is provided. A faulty control module or fault with the serial data circuit can cause no communication with all of the control modules on the vehicle. If any control module communicates on the serial data circuit, continue through the Diagnostic System check, as a future step will address any specific non communicating or group of non communicating control modules.

Once the scan tool has completed the routine, the technician should review each control module that has set a DTC and document them on the Repair Order. When reviewing the DTCs, the technician should take notice if any DTCs are powertrain related, and if so, navigate in the scan tool to the Powertrain area and utilize the Capture Info function. This will upload any Freeze Frame/Failure Records stored in the control module to the scan tool in case the data is lost from the control module. As an example, if the technician commands a Clear DTCs function on a powertrain controller, all diagnostic information stored in the controller is erased. This includes Freeze Frame/Failure Records and Inspection/Maintenance System Status indicators, if required for your region.

6. CONTROL MODULE INTERNAL PERFORMANCE FAULTS — The technician is asked to review the DTCs recorded in step 5 and verify there are no control module internal performance faults set current. This type of fault may be the cause of other symptoms or DTCs displayed by the vehicle. By addressing this fault first, the technician may find the other concerns are resolved. The technician should always follow the diagnostic procedure for these types of faults prior to replacing any control module. If the technician finds a control module has an internal performance fault, a link is provided to *Diagnostic Trouble Code (DTC) List - Vehicle 3-260* to select the appropriate DTC diagnostic procedure.

   Examples:

Note: DTC U3000 is used for both high level control module faults and lower level faults. The fault level is determined by the symptom byte set with the DTC. Examples of some DTC U3000 internal performance fault symptoms are shown below.

- U3000 04 Control Module System Internal Malfunction
- U3000 41 Control Module General Checksum Malfunction
- U3000 49 Control Module Internal Malfunction
- P0606 Control Module Internal Performance
- P0607 Control Module Performance

7. CONTROL MODULE COMMUNICATION VERIFICATION — This step is used to ensure the control modules that are NOT COMMUNICATING were not built on the vehicle. If the technician determines that a control module that is NOT COMMUNICATING should be present, the technician is asked to follow the appropriate diagnostic procedure listed in the [Link target (target-id 148085-) not found] document.
8. COMMUNICATION and POWER MODE FAULTS — This step is asking the technician to look for communication DTCs or DTCs related to control modules powering up based on power mode, communication enable or wake-up circuits. See in the below table some examples of the DTCs the technician should diagnose prior to continuing through the Diagnostic System Check. The technician should review the list of DTCs recorded in step 4 and verify that none of these type of DTCs are present. If so, the technician is referred to the *Diagnostic Trouble Code (DTC) List - Vehicle 3-260* to select the appropriate DTC diagnostic procedure.

   Examples:

Note: DTC U3000 is used for both high level control module faults and lower level faults. The fault level is determined by the symptom byte set with the DTC. Examples of some DTC U3000 communication and power mode faults are shown below.

- U3000 04 Control Module Bus Signal/Message Malfunction
- U0140 Lost Communication with Body Control Module
- U0164 Lost Communication with Heater and Air Conditioning User Interface Control - Front
- U0184 Lost Communication with Radio

- U0402 Invalid Data Received from Transmission Control Module
- U0452 Invalid Data Received from Restraints Control Module
- U001B Gear Shift Control Module Powertrain Sensor Bus Enable
- U300D Ignition Input On/Start
- B1AA3 Run/Crank Relay Coil Control

9. POWER MODE VERIFICATION — This step verifies the Power Mode Master is receiving the proper output state of the ignition switch/push button switch. The technician should use the main power mode input, this being either the ignition key or, on vehicles equipped with Passive Entry Passive Start, the push button switch. The test should not be performed using a key fob, if the MIL is illuminated the powertrain controller may disable this input. The technician is asked to perform the test with the driver door open. This ensures the retained accessory power mode is inactive during this test which could result in different scan tool readings. The technician is only asked to verify the current Power Mode parameter in the power mode data display list. If the parameter does not match the actual ignition switch position, a link is provided to perform the [Link target (target-id 148321-) not found] diagnostic procedure.
10. SERIAL DATA AUTHENTICATION FAULTS — This step verifies that control modules are able to authenticate and verify the legitimacy of certain critical messages on in-vehicle networks. The technician should review the list of DTCs recorded in step 4 and verify that none of these DTCs are present. If so, the technician is referred to the *Diagnostic Trouble Code (DTC) List - Vehicle 3-260* to select the appropriate DTC diagnostic procedure.

    Examples:

    - U1960 Message Authentication Keys Missing or Incomplete
    - U1961 Control Module Security Hardware Internal Malfunction
    - U1962 Unable to Authenticate Serial Data Message
    - U3034 Message Authentication Keys Missing or Incomplete
    - U3035 Unable to Authenticate Serial Data Message
11. PROACTIVE ALERT IDENTIFIERS— The technician is asked in this step to verify there are no Proactive Alert Identifiers set. These identifiers are displayed on the scan tool and will only appear when the OnStar subscription is active and the customer has opted into the Proactive Alert service.
12. ENGINE CRANK and RUN VERIFICATION — Here the technician is asked to verify that the engine cranks and runs. The technician should use the main power mode input, this being either the ignition key or, on vehicles equipped with Passive Entry Passive Start, the push button switch, to complete this step. The test should not be performed using a key fob, if the MIL is illuminated the powertrain controller may disable this input. The technician should know at this point whether the engine cranks and runs without having to actually performing this test step. One of the follow has probably already occurred and this step can be skipped: The technician drove the vehicle into the stall or verified when checking the Crank and Run parameter in step 8. If the technician has not already somehow verified the engine cranks in previous steps, the technician should perform this test step. Regardless of how this step was performed, if the engine does not crank, a link is provided to *Engine Does Not Crank 3-319* or if the engine cranks but does not run, a link is provided to *Engine Cranks But Does Not Run 3-319* for the technician to choose the correct diagnostic procedure for the actual engine application being used.
13. REMAINING DTC REVIEW — Here the technician is asked to review any remaining DTCs that were not addressed in previous steps. The technician is asked first to verify there are no control module supply voltage, system voltage or 5 V circuit DTCs present. Control modules, systems or components with insufficient or zero voltage can cause one or multiple symptoms to exist on the vehicle. Control module voltage issues could also be the cause of failures during a programming event. The technician should correct voltage issues prior to addressing any programming or configuration DTCs. The technician should then check for any ECU programming, setup or configuration DTCs. By programming software or configuring a control module, the technician could correct the customer concern unobtrusively. The remaining DTCs, which are usually specific system or component faults, are diagnosed last. They can include ECU input and output circuit DTCs or individual circuit faults that usually cause single symptoms or failure modes on the vehicle and can be fixed following the proper DTC diagnostic procedure. In general, the technician should think about what DTCs or faults could be caused by another DTC or fault. A failed sensor may set a component DTC and then the system may set a DTC indicating the system cannot operate properly. By correcting the sensor

fault, the system may now operate properly and the system level DTC will transition to history. Refer to the examples within each category below to understand the differences between these DTCs. If DTCs of these type are current, the technician is referred to *Diagnostic Trouble Code (DTC) List - Vehicle 3-260* to choose the correct DTC diagnostic procedure.

13.1. Voltage DTCs

Note: DTC U3000 is used for both high level control module faults and lower level faults. The fault level is determined by the symptom byte set with the DTC. Examples of some DTC U3000 voltage faults are shown below.

- U3000 16 Control Module Circuit Low Voltage
- U3000 17 Control Module Circuit High Voltage
- B19F4 Vehicle 12V Charging System
- P0560 System Voltage
- P0651 Sensor Reference 2 Circuit
- U3006 Control Module Power 1 Circuit

13.2. Programming, Setup, Configuration or Software Performance DTCs

Note: DTC U3000 is used for both high level control module faults and lower level faults. The fault level is determined by the symptom byte set with the DTC. Examples of some DTC U3000 programming, setup, configuration, or software faults are shown below.

- U3000 51 Control Module Not Programmed
- U3000 54 Control Module Missing Calibration
- U3000 55 Control Module Not Configured
- C05D4 Brake Master Cylinder Piston Position Sensor Calibration Not Learned
- P0602 Control Module Not Programmed
- P0630 VIN Not Programmed or Mismatched - Powertrain Control Module (PCM)

13.3. Component related DTCs

Note: DTC U3000 is used for both high level control module faults and lower level faults. The fault level is determined by the symptom byte set with the DTC. Examples of some DTC U3000 component faults are shown below.

- U3000 4A Control Module Incorrect Component Installed
- B0013 Co-Driver Knee Module High Control
- B15A7 Instrument Panel Accent Lighting Control
- C0502 Left Front Wheel Speed Sensor Circuit Low Input
- P0535 Air Conditioning Evaporator Temperature Sensor Circuit
- P0131 Heated Oxygen Sensor Circuit Low
- P0712 Transmission Fluid Temperature Sensor Circuit Low

13.4. System related DTCs

Note: DTC U3000 is used for both high level control module faults and lower level faults. The fault level is determined by the symptom byte set with the DTC. Examples of some DTC U3000 system related faults are shown below.

- U3000 9A Control Module Incorrect Component or System Operating Conditions Exceeded
- B1A04 Front View Camera - Windshield
- C003F Wheel Speed Sensors Direction Correlation
- C2A21 Park Brake Actuator Position Unknown
- P0101 Mass Airflow Sensor Performance
- P175E Transmission Control System - Shift Limiting Active

13.5. Any other remaining DTCs — The technician should diagnose and correct any other DTCs that are left that were not from the categories above.

14. EMISSION RELATED INSPECTION/MAINTENANCE TESTING CONCERNS — Several regions require that a vehicle pass on-board diagnostic system tests and the inspection/maintenance emission tests in order to renew license plates or vehicle registration. This is accomplished by viewing the Inspection/Maintenance System Status display on a scan tool. Using a scan tool, the technician can observe the Inspection/Maintenance System Status in order to verify that the vehicle meets the criteria that comply with the local area requirements. If inspection and maintenance checks are required in your region, and the customer concern is related to not passing an Inspection/Maintenance test, a link is provided to *Inspection/Maintenance System Check 3-319* where the technician can choose the appropriate Inspection/Maintenance System Check for the actual engine application being used.
15. SYMPTOM DIAGNOSIS — At this step, the diagnostics are assuming that the only information the technician has available to diagnose the customer concern are symptoms of a problem.

There are no DTCs set current or history. There may be a Driver Information Center display message or a system indicator to aid in identifying the root cause. The technician should evaluate the symptoms and conditions described by the customer and perform the symptoms diagnostics for the area of customer concern. A link is provided to *Symptoms - Vehicle 3-318* which contains a list of all symptoms related to this service manual publication.

Diagnostic Starting Point - Vehicle

Begin the system diagnosis with *Diagnostic System Check - Vehicle 3-255*. The Diagnostic System Check - Vehicle will provide a complete strategy to locate and repair a mechanical or electrical vehicle fault. Not following this strategy may cause additional diagnostic time and/or misdiagnosis.

The Diagnostic System Check - Vehicle will provide the following strategy:

- When to verify the customer concern and identify related bulletins, recalls and preliminary information
- When to identify a control module that is not communicating, a control module that has set a DTC, and the DTC diagnostic priority
- When to address power mode concerns
- When to verify the engine cranks and runs
- When to diagnose symptom related concerns

Diagnostic System Check - Vehicle

Diagnostic Instructions

- Review *Strategy Based Diagnosis 3-245* for an overview of the diagnostic approach.
- *Diagnostic System Check Instructions 3-249* provides an overview of each diagnostic step.
- Continue through the Diagnostic System Check until you are directed to follow a particular diagnostic or repair procedure. Once a repair has been completed, perform the *Diagnostic Repair Verification 3-319* and verify the customer concern has been corrected.

The diagnostic procedures within this manual are developed on the assumption that the following areas function as designed:

- The 12 V battery is fully charged and cables are clean and tight. Refer to: [Link target (target-id 37781-) not found] .
- Fuses are not open. Refer to: *Power Distribution Schematics 8-789* and *Electrical Center Identification Views 8-30*.
- Ground circuits for the area of customer concern are clean, tight, and in the correct location. Refer to: *Ground Distribution Schematics 8-829* and *Harness Routing Views 8-632*.
- All connectors/terminals fully seated in the area of concern. Refer to: *Master Electrical Component List 8-855*.
- There are no aftermarket devices that affect the operation of the system. Refer to: [Link target (target-id 310488-) not found] .
- The scan tool powers up. Refer to: [Link target (target-id 148078-) not found] .

Updating Control Module Software

For control modules that are able to be reprogrammed, updated software may become available as a part of normal bug correction, feature updates, and control module diagnostic enhancement. In the course of normal fault diagnosis, if a diagnostic procedure indicates to replace a programmable control module, the control module must first be reprogrammed with the latest available software and retested before replacement:

- If updated control module software is available, reprogram the control module and re-test to verify if updated software has corrected the concern. If the updated software has corrected the concern, no further action is required; Do not replace the control module. If the concern persists after programming the control module with the latest software, continue following the diagnostic instructions.
- If updated control module software is not available, continue following the diagnostic instructions.

Diagnostic System Check

1. VERIFY CUSTOMER CONCERN — Understand and validate the customer concern. Inspect the visible system components for obvious damage or conditions that may cause the concern.
2. BULLETIN SEARCH — Check for related bulletins, recall/field actions and preliminary information.
3. MECHANICAL CONCERNS — Verify the symptom is not exclusively a mechanical concern.

⇒ **If the symptom is exclusively a mechanical concern**

Refer to: *Symptoms - Vehicle 3-318*.

⇓ **If the symptom is not a mechanical concern**

Note:

- Do not clear any DTCs unless instructed to do so by a diagnostic procedure. If any DTC is Powertrain related, select Capture Info to store DTC and Freeze Frame/Failure Records to the scan tool.
- Changes in vehicle power mode can be determined by the indicators on the S38 On/Off Vehicle Switch. The indicator should match the selected power mode and change as the power mode is changed.

4. VEHICLE POWER UP VERIFICATION — Vehicle in Service Mode, verify the vehicle powers up.

⇒ **If the vehicle does not power up**

Refer to: [Link target (target-id 148321-) not found] .

⇓ **If the vehicle powers up**

Note: When checking for DTCs and determining what diagnostic actions should be taken, it is important to understand if the DTC is a current DTC or a history DTC. It is not uncommon for vehicles to arrive for service with a DTC that is history and the underlying fault condition no longer present. Refer to *DTC Status Information 3-258* to help determine which DTCs are current and should be diagnosed as such, and which DTCs are not current and should not be considered for diagnosis.

5. CONTROL MODULE COMMUNICATION and DTC CHECK — Using a scan tool, perform the Vehicle DTC Information function and verify at least one control module communicates with the scan tool. Record on the Repair Order the following information:
   - Any control module that is not communicating.
   - Any DTC, including symptom byte, and the control module that has set the DTC.

⇒ **If the scan tool does not communicate with any control module on the vehicle**

Refer to: [Link target (target-id 148085-) not found] .

⇓ **If the scan tool communicates with any control module**

6. CONTROL MODULE INTERNAL PERFORMANCE FAULTS — Verify there are no current control module Internal Hardware Performance DTCs set.

⇒ **If any DTC of this type is set**

Refer to: *Diagnostic Trouble Code (DTC) List - Vehicle 3-260*.

⇓ **If no DTC of this type is set**

Note: If the scan tool is unable to communicate with a control module, attempt to reestablish communication by removing and reconnecting power to the control module. This action will typically be performed in the course of normal fault diagnosis but may also be performed by removing the fuse or fuses powering the control module or by disconnecting the electrical connector(s) at the control module. If communication with the control module is reestablished after removing and reconnecting power, reprogram the control module with the latest software (if available) and re-examine the concern. Do not replace the control module without first determining if new software is available and, if so, programming the control module with the new software to determine if the software has corrected the concern.

7. CONTROL MODULE COMMUNICATION VERIFICATION — Verify the vehicle is equipped with any control module identified as not communicating on the scan tool. For a list of all control modules the vehicle may be equipped with, refer to: [Link target (target-id 148085-) not found] . With all non-communicating control module(s) identified, select the appropriate Data Communication schematic to determine the RPO(s) associated with the control module and verify the RPO is or is not present on the vehicle being diagnosed. All control modules should be communicating, as equipped.

⇒ **If the vehicle is equipped with a control module that is not communicating**

Refer to: [Link target (target-id 148085-) not found] . Select the appropriate Scan Tool Does Not Communicate with Device on CAN link in the Diagnostic Procedure column.

⇓ **If all control modules the vehicle is built with are communicating**

8. COMMUNICATION and POWER MODE FAULTS — Verify there are no current control module Power Mode or Communication DTCs set.

⇒ **If any DTC of this type is set**

Refer to: *Diagnostic Trouble Code (DTC) List - Vehicle 3-260*.

⇓ **If no DTC of this type is set**

Note: The engine may start during this test. Ensure the vehicle is out of gear and the parking brake is applied. Turn the engine OFF as soon as the crank power mode parameter has been observed.

9. POWER MODE VERIFICATION — Driver door open, observe each scan tool Power Mode data parameter while cycling through all power modes. Verify all Power Mode data parameters match the actual ignition switch/push button switch selection.

⇒ **If any Power Mode data parameter does not match**

Refer to: [Link target (target-id 148321-) not found] .

⇓ **If all Power Mode data parameters match**

10. SERIAL DATA AUTHENTICATION FAULTS - Verify DTC U1960, U1961, U1962, U3034, or U3035 is not set.

⇒ **If any of the DTCs are set**

Refer to: *Diagnostic Trouble Code (DTC) List - Vehicle 3-260*.

⇓ **If none of the DTCs are set**

11. PROACTIVE ALERT IDENTIFIERS — The technician is asked in this step to verify there are no Proactive Alert Identifiers set. These identifiers are displayed on the scan tool and will only appear when the OnStar subscription is active and the customer has opted into the Proactive Alert service.

⇒ **If any Proactive Alert Identifier is set**

Refer to: *Proactive Alerts List 3-320*

⇓ **If no Proactive Alert Identifier is set**

12. ENGINE CRANK and RUN VERIFICATION — Verify that the engine cranks and runs.

⇒ **If the engine does not crank**

Refer to: *Engine Does Not Crank 3-319*.

⇒ **If the engine does not run**

Refer to: *Engine Cranks But Does Not Run 3-319*.

⇓ **If the engine cranks and runs**

13. REMAINING DTC REVIEW — Verify there are no other DTCs set.

⇒ **If other DTCs are set**

Diagnose them in the order listed below. Refer to *Diagnostic Trouble Code (DTC) List - Vehicle 3-260*.

13.1. Voltage DTCs

13.2. Programming, Setup or Configuration or Software Performance DTCs

13.3. Component related DTCs

13.4. System related DTCs

13.5. Any remaining DTCs

⇓ **If no other DTCs are set**

14. EMISSION RELATED INSPECTION/MAINTENANCE TESTING CONCERNS — If inspection and maintenance checks are required in your region, verify the customer concern is not related to inspection/maintenance testing.

⇒ **If the customer concern is related to inspection/maintenance testing**

Refer to: *Inspection/Maintenance System Check 3-319*.

⇓ **If the customer concern is not related to inspection/maintenance testing**

15. SYMPTOM DIAGNOSIS — Diagnose any remaining customer concern. Refer to: *Symptoms - Vehicle 3-318*.

DTC Status Information

Diagnostic Trouble Codes (DTCs) are status indicators of the vehicle’s self-diagnostic and reporting capability. Each DTC represents the status of a particular internal test within a control module. Given appropriate conditions, the control module will begin actively monitoring conditions specified by the diagnostic. These are identified and referred to as Conditions for Running the DTC in service information. Each DTC has an associated status, identifying the state of the control module diagnostic. These statuses are identified when viewing DTC information on the scan tool and are described below.

DTC Status

Decoded Value	Description
Not Failed	Test has completed at least once this operating cycle and has passed successfully each time
Current	Test has completed since the last DTC clear, has met the threshold to be stored in long term memory, and has failed the most recent completed test. Test may not have run yet this operation cycle.
History	Test has completed since the last DTC clear, has met the threshold to be stored in long term memory, and has passed the most recent completed test. Test may not have run yet this operation cycle.
Pending	Test has completed and failed at least once in the current or previous operation cycle.
Test Not Complete this Operating Cycle	Test has completed at least once since DTC clear but has not completed yet this operation cycle. Test may have failed since clear but has not met the threshold to be stored in long term memory.
Test Not Complete Since DTC Cleared	Test has not completed successfully since the DTC was last cleared.
Failed Since DTC Cleared	Test has completed since the last DTC clear and failed at least once but has not met the threshold to be stored in long term memory and has not failed during the current or previous operation cycle.

This Operating Cycle

Decoded Value	Description
Failed	Test has completed at least once this operation cycle and has failed at least once.
Not Failed	Test has completed at least once this operation cycle and has passed each time.
Passed and Failed	Test has completed and failed at least once this operation cycle, but the most recent test passed.
Test Not Complete for this DTC	Test has not completed yet this operation cycle.

Last Test

Decoded Value	Description
Passed	Most recent test completed and passed.
Failed	Most recent test completed and failed.
Not Complete Since DTC Cleared	Test has not completed since DTC clear.

Since DTC Clear

Decoded Value	Description
Failed	Test has completed at least once since DTC was cleared and has failed at least once, including the most recent test.
Passed and Failed	Test has completed at least once since DTC was cleared and the most recent test passed, but not all tests have passed.
Not Failed	Test has completed at least once since DTC was cleared and every test has passed.
Test Not Complete for this DTC	Test has not completed yet since DTC was cleared.

Warning Indicator

Decoded Value	Description
Requested	A malfunction indicator has been commanded to be illuminated as a result of this DTC.
Not Requested	A malfunction indicator has not been requested as a result of this DTC.

Diagnosing History DTCs

It is very important to understand DTC status and its relationship to diagnosing a vehicle. If a DTC status is History, this means that the fault is not currently present on the vehicle. In any instance of a history DTC, diagnosis using a DTC diagnostic procedure in service information should not be attempted if not directly related to the customer complaint. Every diagnostic is written only for an active fault with a current DTC. Following a diagnostic procedure when only a history DTC is present will likely result in a misdiagnosis. This is foundational to *Strategy Based Diagnosis 3-245* and outlined as part of *Diagnostic System Check - Vehicle 3-255*.

If a DTC is only presented as a history DTC and is related to the customer complaint, it may be used as a guide or indicator for replicating the condition that caused the DTC to set. Observing the Conditions for Running the DTC in a DTC diagnostic procedure may help in recreating the conditions necessary for the DTC to run. Information within the DTC diagnostic procedure, such as the Fault Information table or Conditions for Setting the DTC, may also be helpful in recreating an intermittent DTC. Refer to Additional Information in *Strategy Based Diagnosis 3-245* for more detail in diagnosing intermittent concerns.

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Emissions Related DTCs

Action Taken When the DTC Sets – Type A

- The control module illuminates the malfunction indicator lamp (MIL) when the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Freeze Frame/Failure Records.

Action Taken When the DTC Sets – Type B

- The control module illuminates the MIL on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.
- The following applies to misfire DTCs:
  - If the control module detects a low level or an emission level misfire condition during 2 consecutive trips, the control module illuminates the MIL.
  - If the control module detects a high level or catalyst damaging misfire, the control module flashes the MIL at a rate of once per second.
  - If the control module detects a misfire during 2 non-consecutive trips, the stored conditions are compared with the current conditions. The control module illuminates the MIL when the following conditions occur:
    - The engine load is within 20 percent of the previous test that failed.
    - The engine speed is within 375 RPM of the previous test that failed.
    - The engine coolant temperature is in the same range of the previous test that failed.
- The following applies to fuel trim DTCs:
  - If the control module detects a fuel trim condition during 2 consecutive trips, the control module illuminates the MIL.
  - If the control module detects a fuel trim condition during 2 non-consecutive trips, the stored conditions are compared with the current conditions. The control module illuminates the MIL when the following conditions occur:
    - The engine load is within 20 percent of the previous test that failed.
    - The engine speed is within 375 RPM of the previous test that failed.
    - The engine coolant temperature is in the same range of the previous test that failed.

Conditions for Clearing the MIL/DTC – Type A or Type B

- The control module turns OFF the MIL after 4 consecutive ignition cycles that the diagnostic runs and does not fail.

- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

Non-Emissions Related DTCs

Action Taken When the DTC Sets – Type C

- The control module stores the DTC information into memory when the diagnostic runs and fails.
- The MIL will not illuminate.
- The control module records the operating conditions at the time the diagnostic fails. The control module stores this information in the Failure Records.
- The driver information center, if equipped, may display a message.

Conditions for Clearing the DTC – Type C

- A current DTC Last Test Failed clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other non-emission related diagnostic.
- Clear the DTC with a scan tool.

Diagnostic Trouble Code (DTC) List - Vehicle

This master list includes all applicable diagnostic trouble codes in alphanumeric order.

Diagnostic Trouble Code (DTC) List - Vehicle

DTC	Diagnostic Procedure
B0001	Supplemental Restraints - [Link target (target-id 289883-) not found]
B0002	Supplemental Restraints - [Link target (target-id 289883-) not found]
B0010	Supplemental Restraints - [Link target (target-id 289884-) not found]
B0011	Supplemental Restraints - [Link target (target-id 289884-) not found]
B0021	Supplemental Restraints - [Link target (target-id 317288-) not found]
B0029	Supplemental Restraints - [Link target (target-id 317288-) not found]
B0070	Supplemental Restraints - [Link target (target-id 317289-) not found]
B0072	Supplemental Restraints - [Link target (target-id 317289-) not found]
B007E	Supplemental Restraints - [Link target (target-id 313882-) not found]
B007F	Supplemental Restraints - [Link target (target-id 313882-) not found]
B0090	Supplemental Restraints - [Link target (target-id 317522-) not found]
B0091	Supplemental Restraints - [Link target (target-id 317522-) not found]
B0092	Supplemental Restraints - [Link target (target-id 317522-) not found]
B0093	Supplemental Restraints - [Link target (target-id 317522-) not found]
B0094	Supplemental Restraints - [Link target (target-id 317522-) not found]
B0095	Supplemental Restraints - [Link target (target-id 317522-) not found]
B0096	Supplemental Restraints - [Link target (target-id 317522-) not found]
B0097	Supplemental Restraints - [Link target (target-id 317522-) not found]
B0098	Supplemental Restraints - [Link target (target-id 317522-) not found]

DTC	Diagnostic Procedure
B012C	Power Outlets - [Link target (target-id 338801-) not found]
B0550	Displays and Gauges - [Link target (target-id 183623-) not found]
B0931	Displays and Gauges - [Link target (target-id 51454-) not found]
B094D	Driver Assistance Systems - [Link target (target-id 283746-) not found]
B094E	Driver Assistance Systems - [Link target (target-id 283746-) not found]
B0987	Driver Assistance Systems - [Link target (target-id 283704-) not found]
B1008	Horns and Pedestrian Alerts - [Link target (target-id 315457-) not found]
B100C	Trailering Systems - [Link target (target-id 326388-) not found]
B1015	Driver Assistance Systems - [Link target (target-id 283664-) not found]
B1023	Wipers and Washers - [Link target (target-id 317708-) not found]
B1033	Cellular, Entertainment, and Navigation - [Link target (target-id 319390-) not found]
B1034	Cellular, Entertainment, and Navigation - [Link target (target-id 319390-) not found]
B1038	Vehicle Access - [Link target (target-id 316927-) not found]
B1048	Lighting - [Link target (target-id 317465-) not found]
B1049	Lighting - [Link target (target-id 317466-) not found]
B1066	Fixed and Moveable Windows - [Link target (target-id 315458-) not found]
B107E	Vehicle Access - [Link target (target-id 317528-) not found]
B107F	Vehicle Access - [Link target (target-id 317528-) not found]
B108E	Lighting - [Link target (target-id 313551-) not found]
B1090	Power Seats - [Link target (target-id 326122-) not found]
B1091	Power Seats - [Link target (target-id 326122-) not found]
B1092	Power Seats - [Link target (target-id 326123-) not found]
B1093	Power Seats - [Link target (target-id 326123-) not found]
B1094	Power Seats - [Link target (target-id 326124-) not found]
B1095	Power Seats - [Link target (target-id 326124-) not found]
B1096	Power Seats - [Link target (target-id 326125-) not found]
B1097	Power Seats - [Link target (target-id 326125-) not found]
B1098	Power Seats - [Link target (target-id 326126-) not found]
B109C	Power Seats - [Link target (target-id 326126-) not found]
B109D	Power Seats - [Link target (target-id 326128-) not found]
B109E	Power Seats - [Link target (target-id 326128-) not found]
B10A9	Trailering Systems - [Link target (target-id 325943-) not found]
B10B4	Supplemental Restraints - [Link target (target-id 317523-) not found]
B10FA	HVAC - Automatic - [Link target (target-id 318791-) not found]
B1105	Power Seats - [Link target (target-id 317270-) not found]
B110A	Displays and Gauges - [Link target (target-id 312300-) not found]
B1114	Cellular, Entertainment, and Navigation - [Link target (target-id 313041-) not found]
B113C	Theft Deterrent - [Link target (target-id 320486-) not found]
B1141	HVAC - Automatic - [Link target (target-id 318791-) not found]
B115E	Vehicle Access - [Link target (target-id 317532-) not found]
B115F	Vehicle Access - [Link target (target-id 317532-) not found]
B1176	Wipers and Washers - [Link target (target-id 313570-) not found]

DTC	Diagnostic Procedure
B11A2	Vehicle Access - [Link target (target-id 317530-) not found]
B11A3	Vehicle Access - [Link target (target-id 317530-) not found]
B11A4	Vehicle Access - [Link target (target-id 317531-) not found]
B11A5	Vehicle Access - [Link target (target-id 317531-) not found]
B11D1	Lighting - [Link target (target-id 317876-) not found]
B11D2	Lighting - [Link target (target-id 317876-) not found]
B120C	Supplemental Restraints - [Link target (target-id 317523-) not found]
B1236	Lighting - [Link target (target-id 313554-) not found]
B1236	Image Display Cameras - [Link target (target-id 319392-) not found]
B124F	Displays and Gauges - [Link target (target-id 224947-) not found]
B125D	Vehicle Access - [Link target (target-id 317533-) not found]
B1267	Wipers and Washers - [Link target (target-id 317709-) not found]
B1270	Driver Assistance Systems - [Link target (target-id 332121-) not found]
B1271	Driver Assistance Systems - [Link target (target-id 332121-) not found]
B1274	Cellular, Entertainment, and Navigation - [Link target (target-id 315515-) not found]
B12AC	Displays and Gauges - [Link target (target-id 319398-) not found]
B12CC	Seat Heating and Cooling - [Link target (target-id 317279-) not found]
B12D4	Supplemental Restraints - [Link target (target-id 317524-) not found]
B12D5	Supplemental Restraints - [Link target (target-id 317524-) not found]
B12FA	Wipers and Washers - [Link target (target-id 316884-) not found]
B132B	Parking Assistance Systems - [Link target (target-id 297192-) not found]
B132C	Parking Assistance Systems - [Link target (target-id 297192-) not found]
B132D	Parking Assistance Systems - [Link target (target-id 297192-) not found]
B132E	Parking Assistance Systems - [Link target (target-id 297192-) not found]
B1338	Seat Heating and Cooling - [Link target (target-id 317279-) not found]
B1339	Seat Heating and Cooling - [Link target (target-id 317279-) not found]
B133A	Seat Heating and Cooling - [Link target (target-id 317279-) not found]
B1346	Cellular, Entertainment, and Navigation - [Link target (target-id 313801-) not found]
B1349	Parking Assistance Systems - [Link target (target-id 317615-) not found]
B137B	Cellular, Entertainment, and Navigation - [Link target (target-id 315515-) not found]
B137C	Cellular, Entertainment, and Navigation - [Link target (target-id 315515-) not found]
B137D	Cellular, Entertainment, and Navigation - [Link target (target-id 315515-) not found]
B1388	Driver Assistance Systems - [Link target (target-id 331168-) not found]
B1389	Driver Assistance Systems - [Link target (target-id 331168-) not found]
B13A9	Supplemental Restraints - [Link target (target-id 329393-) not found]
B13AA	Cellular, Entertainment, and Navigation - [Link target (target-id 313043-) not found]
B13AB	Cellular, Entertainment, and Navigation - [Link target (target-id 317598-) not found]
B13AC	Driver Assistance Systems - [Link target (target-id 297199-) not found]
B13AD	Driver Assistance Systems - [Link target (target-id 297200-) not found]
B13AE	Parking Assistance Systems - [Link target (target-id 297196-) not found]
B13AF	Parking Assistance Systems - [Link target (target-id 297196-) not found]
B13B0	Parking Assistance Systems - [Link target (target-id 297193-) not found]

DTC	Diagnostic Procedure
B13B1	Parking Assistance Systems - [Link target (target-id 297193-) not found]
B13E7	Horns and Pedestrian Alerts - [Link target (target-id 313548-) not found]
B13ED	Cellular, Entertainment, and Navigation - [Link target (target-id 326974-) not found]
B1442	Remote Functions - [Link target (target-id 319783-) not found]
B1444	Remote Functions - [Link target (target-id 319784-) not found]
B1451	Remote Functions - [Link target (target-id 319786-) not found]
B1491	Supplemental Restraints - [Link target (target-id 317525-) not found]
B1511	Remote Functions - [Link target (target-id 319787-) not found]
B1513	Remote Functions - [Link target (target-id 319788-) not found]
B154A	Mirrors - [Link target (target-id 182228-) not found]
B154B	Mirrors - [Link target (target-id 182228-) not found]
B1586	Vehicle Access - [Link target (target-id 347029-) not found]
B1589	Vehicle Access - [Link target (target-id 347544-) not found]
B158A	Vehicle Access - [Link target (target-id 347544-) not found]
B158B	Vehicle Access - [Link target (target-id 347545-) not found]
B1594	Image Display Cameras - [Link target (target-id 361892-) not found]
B1595	Image Display Cameras - [Link target (target-id 309440-) not found]
B1597	Image Display Cameras - [Link target (target-id 309441-) not found]
B1598	Image Display Cameras - [Link target (target-id 309442-) not found]
B15AF	Cellular, Entertainment, and Navigation - [Link target (target-id 313045-) not found]
B15BD	Displays and Gauges - [Link target (target-id 312302-) not found]
B15DF	Supplemental Restraints - [Link target (target-id 317291-) not found]
B15E3	Supplemental Restraints - [Link target (target-id 317291-) not found]
B15EE	Immobilizer - [Link target (target-id 320484-) not found]
B1618	Cellular, Entertainment, and Navigation - [Link target (target-id 313047-) not found]
B1619	Supplemental Restraints - [Link target (target-id 313888-) not found]
B161A	Supplemental Restraints - [Link target (target-id 313888-) not found]
B16C5	Vehicle Access - [Link target (target-id 313566-) not found]
B170C	Seat Heating and Cooling - [Link target (target-id 317280-) not found]
B170E	Seat Heating and Cooling - [Link target (target-id 317280-) not found]
B1710	Vehicle Access - [Link target (target-id 316933-) not found]
B1711	Vehicle Access - [Link target (target-id 316933-) not found]
B171C	Vehicle Access - [Link target (target-id 317538-) not found]
B172E	Driver Assistance Systems - [Link target (target-id 283653-) not found]
B172F	Driver Assistance Systems - [Link target (target-id 283653-) not found]
B1737	Cellular, Entertainment, and Navigation - [Link target (target-id 304104-) not found]
B174E	Cellular, Entertainment, and Navigation - [Link target (target-id 324214-) not found]
B176A	Vehicle Access - [Link target (target-id 316934-) not found]
B178C	Cellular, Entertainment, and Navigation - [Link target (target-id 313049-) not found]
B17F0	Supplemental Restraints - [Link target (target-id 328903-) not found]
B17F2	Supplemental Restraints - [Link target (target-id 328903-) not found]
B17FE	Vehicle Access - [Link target (target-id 317538-) not found]

DTC	Diagnostic Procedure
B1800	Vehicle Access - [Link target (target-id 317533-) not found]
B1802	Vehicle Access - [Link target (target-id 317531-) not found]
B1803	Vehicle Access - [Link target (target-id 317538-) not found]
B1804	Vehicle Access - [Link target (target-id 317530-) not found]
B1805	Vehicle Access - [Link target (target-id 317533-) not found]
B1835	Lighting - [Link target (target-id 317470-) not found]
B1836	Lighting - [Link target (target-id 317471-) not found]
B1837	Lighting - [Link target (target-id 313557-) not found]
B187B	Seat Heating and Cooling - [Link target (target-id 363709-) not found]
B187D	Seat Heating and Cooling - [Link target (target-id 363709-) not found]
B187E	Trailering Systems - [Link target (target-id 326389-) not found]
B1918	Lighting - [Link target (target-id 317472-) not found]
B1952	Fixed and Moveable Windows - [Link target (target-id 317545-) not found]
B1953	Fixed and Moveable Windows - [Link target (target-id 323948-) not found]
B1954	Fixed and Moveable Windows - [Link target (target-id 323949-) not found]
B1955	Fixed and Moveable Windows - [Link target (target-id 323950-) not found]
B1956	Fixed and Moveable Windows - [Link target (target-id 349387-) not found]
B1957	Fixed and Moveable Windows - [Link target (target-id 349387-) not found]
B195A	Lighting - [Link target (target-id 331609-) not found]
B1960	Cellular, Entertainment, and Navigation - [Link target (target-id 319390-) not found]
B1960	Cellular, Entertainment, and Navigation - [Link target (target-id 304095-) not found]
B1961	Cellular, Entertainment, and Navigation - [Link target (target-id 319390-) not found]
B1961	Cellular, Entertainment, and Navigation - [Link target (target-id 304095-) not found]
B1962	Cellular, Entertainment, and Navigation - [Link target (target-id 319390-) not found]
B1962	Cellular, Entertainment, and Navigation - [Link target (target-id 304095-) not found]
B1963	Cellular, Entertainment, and Navigation - [Link target (target-id 319390-) not found]
B1963	Cellular, Entertainment, and Navigation - [Link target (target-id 304095-) not found]
B1964	Cellular, Entertainment, and Navigation - [Link target (target-id 317602-) not found]
B1965	Cellular, Entertainment, and Navigation - [Link target (target-id 313050-) not found]
B196D	Power Seats - [Link target (target-id 317272-) not found]
B196E	Power Seats - [Link target (target-id 320495-) not found]
B196F	Power Seats - [Link target (target-id 317273-) not found]
B1970	Power Seats - [Link target (target-id 320496-) not found]
B1977	Immobilizer - [Link target (target-id 313612-) not found]
B197D	Immobilizer - [Link target (target-id 313618-) not found]
B197F	Immobilizer - [Link target (target-id 313620-) not found]
B1980	Immobilizer - [Link target (target-id 313621-) not found]
B1981	Immobilizer - [Link target (target-id 313622-) not found]
B1987	Immobilizer - [Link target (target-id 313623-) not found]
B1989	Immobilizer - [Link target (target-id 313625-) not found]
B198A	Immobilizer - [Link target (target-id 313626-) not found]
B198B	Wipers and Washers - [Link target (target-id 316885-) not found]

DTC	Diagnostic Procedure
B198F	Lighting - [Link target (target-id 317877-) not found]
B1990	Lighting - [Link target (target-id 317877-) not found]
B1991	Lighting - [Link target (target-id 313648-) not found]
B1994	Lighting - [Link target (target-id 317879-) not found]
B1995	Lighting - [Link target (target-id 317879-) not found]
B1996	Lighting - [Link target (target-id 317880-) not found]
B1997	Lighting - [Link target (target-id 317880-) not found]
B1998	Lighting - [Link target (target-id 317881-) not found]
B1999	Lighting - [Link target (target-id 317881-) not found]
B199A	Lighting - [Link target (target-id 317882-) not found]
B199B	Lighting - [Link target (target-id 317882-) not found]
B199C	Lighting - [Link target (target-id 317883-) not found]
B199D	Lighting - [Link target (target-id 317883-) not found]
B19A0	Lighting - [Link target (target-id 313663-) not found]
B19A1	Lighting - [Link target (target-id 317885-) not found]
B19A2	Lighting - [Link target (target-id 317885-) not found]
B19A3	Lighting - [Link target (target-id 313559-) not found]
B19A4	Lighting - [Link target (target-id 313559-) not found]
B19B0	Displays and Gauges - [Link target (target-id 313904-) not found]
B19B1	Cellular, Entertainment, and Navigation - [Link target (target-id 319000-) not found]
B19B6	Power Seats - [Link target (target-id 317276-) not found]
B19BA	Lighting - [Link target (target-id 317476-) not found]
B19BB	Parking Assistance Systems - [Link target (target-id 297191-) not found]
B19BC	Parking Assistance Systems - [Link target (target-id 297191-) not found]
B19BD	Parking Assistance Systems - [Link target (target-id 297191-) not found]
B19BE	Parking Assistance Systems - [Link target (target-id 297191-) not found]
B19C2	Seat Heating and Cooling - [Link target (target-id 317281-) not found]
B19C3	Seat Heating and Cooling - [Link target (target-id 317281-) not found]
B19C5	Lighting - [Link target (target-id 317886-) not found]
B19C6	Lighting - [Link target (target-id 317886-) not found]
B19C8	Vehicle Access - [Link target (target-id 317262-) not found]
B19C9	Vehicle Access - [Link target (target-id 317262-) not found]
B19CA	Seat Heating and Cooling - [Link target (target-id 317282-) not found]
B19CB	Seat Heating and Cooling - [Link target (target-id 317282-) not found]
B19CC	Seat Heating and Cooling - [Link target (target-id 317282-) not found]
B19CD	Seat Heating and Cooling - [Link target (target-id 317282-) not found]
B19CE	Seat Heating and Cooling - [Link target (target-id 327580-) not found]
B19CF	Seat Heating and Cooling - [Link target (target-id 327580-) not found]
B19D0	Seat Heating and Cooling - [Link target (target-id 327580-) not found]
B19D1	Seat Heating and Cooling - [Link target (target-id 327580-) not found]
B19D6	Seat Heating and Cooling - [Link target (target-id 317283-) not found]
B19D7	Seat Heating and Cooling - [Link target (target-id 327566-) not found]

DTC	Diagnostic Procedure
B19D9	Sunroof - [Link target (target-id 313609-) not found]
B19DA	Cellular, Entertainment, and Navigation - [Link target (target-id 313051-) not found]
B19F2	Steering Wheel and Column - [Link target (target-id 317603-) not found]
B19F4	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314836-) not found]
B1A01	Driver Assistance Systems - [Link target (target-id 302513-) not found]
B1A04	Driver Assistance Systems - [Link target (target-id 310121-) not found]
B1A1B	Data Communications - [Link target (target-id 297097-) not found]
B1A1F	Data Communications - [Link target (target-id 317030-) not found]
B1A23	Data Communications - [Link target (target-id 317034-) not found]
B1A25	Data Communications - [Link target (target-id 317036-) not found]
B1A2C	HVAC - Automatic - [Link target (target-id 347808-) not found]
B1A2C	HVAC - Manual - [Link target (target-id 348702-) not found]
B1A2F	Lighting - [Link target (target-id 317490-) not found]
B1A30	Parking Assistance Systems - [Link target (target-id 317616-) not found]
B1A33	Supplemental Restraints - [Link target (target-id 313892-) not found]
B1A34	Supplemental Restraints - [Link target (target-id 317293-) not found]
B1A35	Supplemental Restraints - [Link target (target-id 317294-) not found]
B1A36	Cellular, Entertainment, and Navigation - [Link target (target-id 313052-) not found]
B1A37	Secondary and Configurable Customer Controls - [Link target (target-id 323237-) not found]
B1A4B	Power Outlets - [Link target (target-id 338328-) not found]
B1A4C	Steering Wheel and Column - [Link target (target-id 317604-) not found]
B1A57	Interior Trim and Paneling - [Link target (target-id 321209-) not found]
B1A5E	Image Display Cameras - [Link target (target-id 319520-) not found]
B1A62	Image Display Cameras - [Link target (target-id 361892-) not found]
B1A65	Power Seats - [Link target (target-id 317277-) not found]
B1A66	Power Seats - [Link target (target-id 317277-) not found]
B1A67	Power Seats - [Link target (target-id 317277-) not found]
B1A68	Image Display Cameras - [Link target (target-id 309444-) not found]
B1A69	Image Display Cameras - [Link target (target-id 309445-) not found]
B1A6A	Image Display Cameras - [Link target (target-id 309446-) not found]
B1A6C	Image Display Cameras - [Link target (target-id 309447-) not found]
B1A72	Trailering Systems - [Link target (target-id 325950-) not found]
B1A75	Trailering Systems - [Link target (target-id 325953-) not found]
B1A76	Wiring Systems and Power Management - [Link target (target-id 317723-) not found]
B1A78	Power Outlets - [Link target (target-id 331014-) not found]
B1A79	Power Outlets - [Link target (target-id 338329-) not found]
B1A7A	Supplemental Restraints - [Link target (target-id 317295-) not found]
B1A80	Lighting - [Link target (target-id 359323-) not found]
B1A81	Lighting - [Link target (target-id 313562-) not found]
B1A82	Power Seats - [Link target (target-id 326129-) not found]
B1A83	Power Seats - [Link target (target-id 326129-) not found]
B1A84	Power Seats - [Link target (target-id 326130-) not found]

DTC	Diagnostic Procedure
B1A85	Power Seats - [Link target (target-id 326130-) not found]
B1A91	Cellular, Entertainment, and Navigation - [Link target (target-id 323932-) not found]
B1A95	Cellular, Entertainment, and Navigation - [Link target (target-id 323936-) not found]
B1A96	Cellular, Entertainment, and Navigation - [Link target (target-id 323936-) not found]
B1A99	Cellular, Entertainment, and Navigation - [Link target (target-id 323938-) not found]
B1A9A	Cellular, Entertainment, and Navigation - [Link target (target-id 323938-) not found]
B1A9B	Image Display Cameras - [Link target (target-id 361892-) not found]
B1A9C	Image Display Cameras - [Link target (target-id 309449-) not found]
B1A9D	Image Display Cameras - [Link target (target-id 309450-) not found]
B1A9E	Image Display Cameras - [Link target (target-id 309451-) not found]
B1AA3	Wiring Systems and Power Management - [Link target (target-id 313605-) not found]
B1AB0	Trailering Systems - [Link target (target-id 325955-) not found]
B1ABB	Vehicle Access - [Link target (target-id 347133-) not found]
B1AC2	Wiring Systems and Power Management - [Link target (target-id 313601-) not found]
B1AC3	Wiring Systems and Power Management - [Link target (target-id 313602-) not found]
B1AD0	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 327526-) not found]
B1AD2	Seat Belts - [Link target (target-id 330173-) not found]
B1AD3	Seat Belts - [Link target (target-id 317300-) not found]
B1ADD	Seat Heating and Cooling - [Link target (target-id 327567-) not found]
B1ADE	Seat Heating and Cooling - [Link target (target-id 327567-) not found]
B1ADF	Remote Functions - [Link target (target-id 319790-) not found]
B1AEE	Remote Functions - [Link target (target-id 319791-) not found]
B1B0A	Frame and Underbody - [Link target (target-id 325180-) not found]
B1B0B	Frame and Underbody - [Link target (target-id 325180-) not found]
B1B0C	Lighting - [Link target (target-id 329962-) not found]
B1B0D	Lighting - [Link target (target-id 329962-) not found]
B1B12	Wiring Systems and Power Management - [Link target (target-id 317724-) not found]
B1B13	Fixed and Moveable Windows - [Link target (target-id 332471-) not found]
B1B15	Wiring Systems and Power Management - [Link target (target-id 317726-) not found]
B1B19	Cellular, Entertainment, and Navigation - [Link target (target-id 319001-) not found]
B1B2F	Cellular, Entertainment, and Navigation - [Link target (target-id 317735-) not found]
B1B42	Wiring Systems and Power Management - [Link target (target-id 322002-) not found]
B1B4B	Vehicle Access - [Link target (target-id 316933-) not found]
B1B4D	Image Display Cameras - [Link target (target-id 333111-) not found]
B1B4E	Image Display Cameras - [Link target (target-id 332633-) not found]
B1B4F	Image Display Cameras - [Link target (target-id 332634-) not found]
B1B50	Image Display Cameras - [Link target (target-id 332635-) not found]
B1B51	Image Display Cameras - [Link target (target-id 332636-) not found]
B1B52	Image Display Cameras - [Link target (target-id 332637-) not found]
B1B55	Trailering Systems - [Link target (target-id 325956-) not found]
B1B56	Trailering Systems - [Link target (target-id 325958-) not found]
B1B57	Trailering Systems - [Link target (target-id 325958-) not found]

DTC	Diagnostic Procedure
B1B58	Trailering Systems - [Link target (target-id 325960-) not found]
B1B5C	Vehicle Access - [Link target (target-id 333026-) not found]
B1B6E	Vehicle Access - [Link target (target-id 333036-) not found]
B1B70	Vehicle Access - [Link target (target-id 333036-) not found]
B1B71	Vehicle Access - [Link target (target-id 333036-) not found]
B1B72	Vehicle Access - [Link target (target-id 333036-) not found]
B1B73	Vehicle Access - [Link target (target-id 333037-) not found]
B1B74	Vehicle Access - [Link target (target-id 333027-) not found]
B1B75	Vehicle Access - [Link target (target-id 333028-) not found]
B1B79	Cellular, Entertainment, and Navigation - [Link target (target-id 333272-) not found]
B1B83	Trailering Systems - [Link target (target-id 325961-) not found]
B1B84	Vehicle Access - [Link target (target-id 333028-) not found]
B1BB5	Trailering Systems - [Link target (target-id 325943-) not found]
B1BB6	Wiring Systems and Power Management - [Link target (target-id 332638-) not found]
B1BE7	Lighting - [Link target (target-id 340107-) not found]
B1BE8	Lighting - [Link target (target-id 340107-) not found]
B1C09	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 200414-) not found]
B1C0A	Vehicle Access - [Link target (target-id 325974-) not found]
B1C0B	Lighting - [Link target (target-id 347534-) not found]
B1C0C	Lighting - [Link target (target-id 347534-) not found]
B1C0D	Lighting - [Link target (target-id 345993-) not found]
B1C57	Vehicle Access - [Link target (target-id 333039-) not found]
B1C58	Vehicle Access - [Link target (target-id 347133-) not found]
B1C59	Vehicle Access - [Link target (target-id 333036-) not found]
B1CC6	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CC7	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CC8	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CC9	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CCA	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CCB	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CCC	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CCD	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CCE	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CCF	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD0	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD1	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD2	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD3	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD4	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD5	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD6	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD7	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]

DTC	Diagnostic Procedure
B1CD8	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CD9	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CDA	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CDB	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CDC	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CDD	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CDE	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CDF	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CE0	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CE1	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CE2	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B1CE3	Wiring Systems and Power Management - [Link target (target-id 348761-) not found]
B272D	Rear Drive Axle - [Link target (target-id 282299-) not found]
B2A00	Vehicle Access - [Link target (target-id 313568-) not found]
B2A01	HVAC - Automatic - [Link target (target-id 320816-) not found]
B2A01	HVAC - Manual - [Link target (target-id 337961-) not found]
B2A02	HVAC - Automatic - [Link target (target-id 320816-) not found]
B2A02	HVAC - Manual - [Link target (target-id 337961-) not found]
B2A03	HVAC - Automatic - [Link target (target-id 320816-) not found]
B2A03	HVAC - Manual - [Link target (target-id 337961-) not found]
B2A04	HVAC - Automatic - [Link target (target-id 320816-) not found]
B2A04	HVAC - Manual - [Link target (target-id 337961-) not found]
B2A05	HVAC - Automatic - [Link target (target-id 320816-) not found]
B2A05	HVAC - Manual - [Link target (target-id 337961-) not found]
B2A16	HVAC - Automatic - [Link target (target-id 320821-) not found]
B2A16	HVAC - Manual - [Link target (target-id 337962-) not found]
B2A17	HVAC - Automatic - [Link target (target-id 320821-) not found]
B2A17	HVAC - Manual - [Link target (target-id 337962-) not found]
B2A18	HVAC - Automatic - [Link target (target-id 320821-) not found]
B2A18	HVAC - Manual - [Link target (target-id 337962-) not found]
B2A19	HVAC - Automatic - [Link target (target-id 320821-) not found]
B2A19	HVAC - Manual - [Link target (target-id 337962-) not found]
B2A1A	HVAC - Automatic - [Link target (target-id 320822-) not found]
B2A1A	HVAC - Manual - [Link target (target-id 337963-) not found]
B2A1B	HVAC - Automatic - [Link target (target-id 320822-) not found]
B2A1B	HVAC - Manual - [Link target (target-id 337963-) not found]
B2A1C	HVAC - Automatic - [Link target (target-id 320822-) not found]
B2A1C	HVAC - Manual - [Link target (target-id 337963-) not found]
B2A1D	HVAC - Automatic - [Link target (target-id 320822-) not found]
B2A1D	HVAC - Manual - [Link target (target-id 337963-) not found]
B2A1E	HVAC - Automatic - [Link target (target-id 320823-) not found]
B2A1E	HVAC - Manual - [Link target (target-id 337964-) not found]

DTC	Diagnostic Procedure
B2A1F	HVAC - Automatic - [Link target (target-id 320823-) not found]
B2A1F	HVAC - Manual - [Link target (target-id 337964-) not found]
B2A20	HVAC - Automatic - [Link target (target-id 320823-) not found]
B2A20	HVAC - Manual - [Link target (target-id 337964-) not found]
B2A21	HVAC - Automatic - [Link target (target-id 320823-) not found]
B2A21	HVAC - Manual - [Link target (target-id 337964-) not found]
B2A36	HVAC - Automatic - [Link target (target-id 320829-) not found]
B2A37	HVAC - Automatic - [Link target (target-id 320829-) not found]
B2A38	HVAC - Automatic - [Link target (target-id 320829-) not found]
B2A39	HVAC - Automatic - [Link target (target-id 320829-) not found]
B2A3E	HVAC - Automatic - [Link target (target-id 320831-) not found]
B2A3F	HVAC - Automatic - [Link target (target-id 320831-) not found]
B2A40	HVAC - Automatic - [Link target (target-id 320831-) not found]
B2A41	HVAC - Automatic - [Link target (target-id 320831-) not found]
B2A42	HVAC - Automatic - [Link target (target-id 320832-) not found]
B2A43	HVAC - Automatic - [Link target (target-id 320832-) not found]
B2A44	HVAC - Automatic - [Link target (target-id 320832-) not found]
B2A45	HVAC - Automatic - [Link target (target-id 320832-) not found]
B2A4E	HVAC - Manual - [Link target (target-id 347483-) not found]
B2A4F	HVAC - Manual - [Link target (target-id 347483-) not found]
B2A50	HVAC - Manual - [Link target (target-id 347483-) not found]
B2A51	HVAC - Manual - [Link target (target-id 347483-) not found]
B2A67	HVAC - Automatic - [Link target (target-id 320842-) not found]
B2A67	HVAC - Manual - [Link target (target-id 337967-) not found]
B2A68	HVAC - Automatic - [Link target (target-id 320842-) not found]
B2A68	HVAC - Manual - [Link target (target-id 337967-) not found]
B2A69	HVAC - Automatic - [Link target (target-id 320842-) not found]
B2A69	HVAC - Manual - [Link target (target-id 337967-) not found]
B2A6A	HVAC - Automatic - [Link target (target-id 320842-) not found]
B2A6A	HVAC - Manual - [Link target (target-id 337967-) not found]
B2A6B	HVAC - Automatic - [Link target (target-id 320843-) not found]
B2A6B	HVAC - Manual - [Link target (target-id 337968-) not found]
B2A6C	HVAC - Automatic - [Link target (target-id 320843-) not found]
B2A6C	HVAC - Manual - [Link target (target-id 337968-) not found]
B2A6D	HVAC - Automatic - [Link target (target-id 320843-) not found]
B2A6D	HVAC - Manual - [Link target (target-id 337968-) not found]
B2A6E	HVAC - Automatic - [Link target (target-id 320843-) not found]
B2A6E	HVAC - Manual - [Link target (target-id 337968-) not found]
B2A73	HVAC - Automatic - [Link target (target-id 320845-) not found]
B2A73	HVAC - Manual - [Link target (target-id 343518-) not found]
B2A74	HVAC - Automatic - [Link target (target-id 320845-) not found]
B2A74	HVAC - Manual - [Link target (target-id 343518-) not found]

DTC	Diagnostic Procedure
B2A75	HVAC - Automatic - [Link target (target-id 320845-) not found]
B2A75	HVAC - Manual - [Link target (target-id 343518-) not found]
B2A76	HVAC - Automatic - [Link target (target-id 320845-) not found]
B2A76	HVAC - Manual - [Link target (target-id 343518-) not found]
B2A7B	HVAC - Automatic - [Link target (target-id 320847-) not found]
B2A7B	HVAC - Manual - [Link target (target-id 343519-) not found]
B2A7C	HVAC - Automatic - [Link target (target-id 320847-) not found]
B2A7C	HVAC - Manual - [Link target (target-id 343519-) not found]
B2A7D	HVAC - Automatic - [Link target (target-id 320847-) not found]
B2A7D	HVAC - Manual - [Link target (target-id 343519-) not found]
B2A7E	HVAC - Automatic - [Link target (target-id 320847-) not found]
B2A7E	HVAC - Manual - [Link target (target-id 343519-) not found]
B2A86	HVAC - Automatic - [Link target (target-id 317682-) not found]
B2A87	HVAC - Automatic - [Link target (target-id 320850-) not found]
B2A88	HVAC - Automatic - [Link target (target-id 320850-) not found]
B2A89	HVAC - Automatic - [Link target (target-id 320850-) not found]
B2A8A	HVAC - Automatic - [Link target (target-id 320850-) not found]
B2A8B	HVAC - Automatic - [Link target (target-id 320851-) not found]
B2A8C	HVAC - Automatic - [Link target (target-id 320851-) not found]
B2A8D	HVAC - Automatic - [Link target (target-id 320851-) not found]
B2A8E	HVAC - Automatic - [Link target (target-id 320851-) not found]
B2A8F	HVAC - Automatic - [Link target (target-id 320852-) not found]
B2A90	HVAC - Automatic - [Link target (target-id 320852-) not found]
B2A91	HVAC - Automatic - [Link target (target-id 320852-) not found]
B2A92	HVAC - Automatic - [Link target (target-id 320852-) not found]
B2A93	HVAC - Automatic - [Link target (target-id 320853-) not found]
B2A94	HVAC - Automatic - [Link target (target-id 320853-) not found]
B2A95	HVAC - Automatic - [Link target (target-id 320853-) not found]
B2A96	HVAC - Automatic - [Link target (target-id 320853-) not found]
B2A97	HVAC - Automatic - [Link target (target-id 320854-) not found]
B2A98	HVAC - Automatic - [Link target (target-id 320854-) not found]
B2A99	HVAC - Automatic - [Link target (target-id 320854-) not found]
B2A9A	HVAC - Automatic - [Link target (target-id 320854-) not found]
B2A9B	HVAC - Automatic - [Link target (target-id 320855-) not found]
B2A9C	HVAC - Automatic - [Link target (target-id 320855-) not found]
B2A9D	HVAC - Automatic - [Link target (target-id 320855-) not found]
B2A9E	HVAC - Automatic - [Link target (target-id 320855-) not found]
B2AA7	HVAC - Manual - [Link target (target-id 347494-) not found]
B2AA8	HVAC - Manual - [Link target (target-id 347494-) not found]
B2AA9	HVAC - Manual - [Link target (target-id 347494-) not found]
B2AAA	HVAC - Manual - [Link target (target-id 347494-) not found]
B2AEF	HVAC - Automatic - [Link target (target-id 317704-) not found]

DTC	Diagnostic Procedure
B2AEF	HVAC - Manual - [Link target (target-id 337971-) not found]
B2AF0	HVAC - Automatic - [Link target (target-id 317704-) not found]
B2AF0	HVAC - Manual - [Link target (target-id 337971-) not found]
B2AF1	HVAC - Automatic - [Link target (target-id 317704-) not found]
B2AF1	HVAC - Manual - [Link target (target-id 337971-) not found]
B2AF2	HVAC - Automatic - [Link target (target-id 317704-) not found]
B2AF2	HVAC - Manual - [Link target (target-id 337971-) not found]
B2AF3	HVAC - Automatic - [Link target (target-id 317704-) not found]
B2AF3	HVAC - Manual - [Link target (target-id 337971-) not found]
B2AF4	HVAC - Automatic - [Link target (target-id 317704-) not found]
B2AF4	HVAC - Manual - [Link target (target-id 337971-) not found]
B2AF5	HVAC - Automatic - [Link target (target-id 317705-) not found]
B2AF6	HVAC - Automatic - [Link target (target-id 317705-) not found]
B2AF7	HVAC - Automatic - [Link target (target-id 317705-) not found]
B2AF8	HVAC - Automatic - [Link target (target-id 317705-) not found]
B2AF9	HVAC - Automatic - [Link target (target-id 317705-) not found]
B2AFA	HVAC - Automatic - [Link target (target-id 317705-) not found]
B2AFB	HVAC - Automatic - [Link target (target-id 317706-) not found]
B2AFC	HVAC - Automatic - [Link target (target-id 317706-) not found]
B2AFD	HVAC - Automatic - [Link target (target-id 317706-) not found]
B2AFE	HVAC - Automatic - [Link target (target-id 317706-) not found]
B2AFF	HVAC - Automatic - [Link target (target-id 321874-) not found]
B2AFF	HVAC - Manual - [Link target (target-id 337974-) not found]
B2B00	HVAC - Automatic - [Link target (target-id 321874-) not found]
B2B00	HVAC - Manual - [Link target (target-id 337974-) not found]
B2B01	HVAC - Automatic - [Link target (target-id 321874-) not found]
B2B01	HVAC - Manual - [Link target (target-id 337974-) not found]
B2B02	HVAC - Automatic - [Link target (target-id 317701-) not found]
B2B02	HVAC - Manual - [Link target (target-id 337975-) not found]
B2B03	HVAC - Automatic - [Link target (target-id 317701-) not found]
B2B03	HVAC - Manual - [Link target (target-id 337975-) not found]
B2B05	HVAC - Automatic - [Link target (target-id 321289-) not found]
B2B05	HVAC - Manual - [Link target (target-id 337976-) not found]
B2B06	HVAC - Automatic - [Link target (target-id 321290-) not found]
B2B07	HVAC - Automatic - [Link target (target-id 321291-) not found]
B2B07	HVAC - Manual - [Link target (target-id 337978-) not found]
B2B09	HVAC - Automatic - [Link target (target-id 321293-) not found]
B2B09	HVAC - Manual - [Link target (target-id 337979-) not found]
B2B0B	HVAC - Automatic - [Link target (target-id 317701-) not found]
B2B0B	HVAC - Manual - [Link target (target-id 337975-) not found]
B2B0C	HVAC - Automatic - [Link target (target-id 317701-) not found]
B2B0C	HVAC - Manual - [Link target (target-id 337975-) not found]

DTC	Diagnostic Procedure
B2B11	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 303006-) not found]
B2B12	Data Communications - [Link target (target-id 301773-) not found]
B2B13	Data Communications - [Link target (target-id 301773-) not found]
B2B22	HVAC - Automatic - [Link target (target-id 321291-) not found]
B2B22	HVAC - Manual - [Link target (target-id 337978-) not found]
B2B23	HVAC - Automatic - [Link target (target-id 321291-) not found]
B2B23	HVAC - Manual - [Link target (target-id 337978-) not found]
B2B24	HVAC - Automatic - [Link target (target-id 321291-) not found]
B2B24	HVAC - Manual - [Link target (target-id 337978-) not found]
B2B28	HVAC - Automatic - [Link target (target-id 321289-) not found]
B2B28	HVAC - Manual - [Link target (target-id 337976-) not found]
B2B29	HVAC - Automatic - [Link target (target-id 321289-) not found]
B2B29	HVAC - Manual - [Link target (target-id 337976-) not found]
B2B2A	HVAC - Automatic - [Link target (target-id 321289-) not found]
B2B2A	HVAC - Manual - [Link target (target-id 337976-) not found]
B2B2B	HVAC - Automatic - [Link target (target-id 321290-) not found]
B2B2C	HVAC - Automatic - [Link target (target-id 321290-) not found]
B2B2D	HVAC - Automatic - [Link target (target-id 321290-) not found]
B2B2E	HVAC - Automatic - [Link target (target-id 321293-) not found]
B2B2E	HVAC - Manual - [Link target (target-id 337979-) not found]
B2B2F	HVAC - Automatic - [Link target (target-id 321293-) not found]
B2B2F	HVAC - Manual - [Link target (target-id 337979-) not found]
B2B30	HVAC - Automatic - [Link target (target-id 321293-) not found]
B2B30	HVAC - Manual - [Link target (target-id 337979-) not found]
B2BA2	Wiring Systems and Power Management - [Link target (target-id 321482-) not found]
B2BA3	Wiring Systems and Power Management - [Link target (target-id 321482-) not found]
B356A	Driver Assistance Systems - [Link target (target-id 283667-) not found]
B395D	Driver Assistance Systems - [Link target (target-id 306938-) not found]
C0001	Antilock Brake System - [Link target (target-id 306998-) not found]
C0002	Antilock Brake System - [Link target (target-id 306998-) not found]
C0003	Antilock Brake System - [Link target (target-id 306998-) not found]
C0004	Antilock Brake System - [Link target (target-id 306998-) not found]
C0010	Antilock Brake System - [Link target (target-id 218397-) not found]
C0011	Antilock Brake System - [Link target (target-id 218397-) not found]
C0012	Antilock Brake System - [Link target (target-id 218397-) not found]
C0013	Antilock Brake System - [Link target (target-id 218397-) not found]
C0014	Antilock Brake System - [Link target (target-id 218397-) not found]
C0015	Antilock Brake System - [Link target (target-id 218397-) not found]
C0016	Antilock Brake System - [Link target (target-id 218397-) not found]
C0017	Antilock Brake System - [Link target (target-id 218397-) not found]
C0018	Antilock Brake System - [Link target (target-id 218397-) not found]
C0019	Antilock Brake System - [Link target (target-id 218397-) not found]

DTC	Diagnostic Procedure
C001C	Antilock Brake System - [Link target (target-id 218397-) not found]
C001D	Antilock Brake System - [Link target (target-id 218397-) not found]
C0024	Antilock Brake System - [Link target (target-id 127367-) not found]
C003F	Antilock Brake System - [Link target (target-id 302605-) not found]
C0049	Hydraulic Brakes - [Link target (target-id 301650-) not found]
C004A	Disc Brakes - [Link target (target-id 313905-) not found]
C004B	Hydraulic Brakes - [Link target (target-id 325748-) not found]
C0051	Antilock Brake System - [Link target (target-id 1508-) not found]
C0056	Antilock Brake System - [Link target (target-id 340056-) not found]
C0057	Antilock Brake System - [Link target (target-id 340056-) not found]
C0058	Antilock Brake System - [Link target (target-id 340056-) not found]
C0059	Antilock Brake System - [Link target (target-id 340056-) not found]
C0061	Antilock Brake System - [Link target (target-id 309335-) not found]
C0062	Antilock Brake System - [Link target (target-id 309335-) not found]
C0063	Antilock Brake System - [Link target (target-id 309335-) not found]
C006A	Supplemental Restraints - [Link target (target-id 329408-) not found]
C006B	Antilock Brake System - [Link target (target-id 200325-) not found]
C0072	Disc Brakes - [Link target (target-id 310755-) not found]
C0131	Antilock Brake System - [Link target (target-id 64893-) not found]
C0186	Antilock Brake System - [Link target (target-id 176323-) not found]
C0196	Antilock Brake System - [Link target (target-id 176323-) not found]
C0273	Antilock Brake System - [Link target (target-id 73137-) not found]
C0287	Antilock Brake System - [Link target (target-id 176323-) not found]
C02D5	Antilock Brake System - [Link target (target-id 349538-) not found]
C0500	Antilock Brake System - [Link target (target-id 302606-) not found]
C0501	Antilock Brake System - [Link target (target-id 302606-) not found]
C0502	Antilock Brake System - [Link target (target-id 302606-) not found]
C0503	Antilock Brake System - [Link target (target-id 302606-) not found]
C0504	Antilock Brake System - [Link target (target-id 302606-) not found]
C0505	Antilock Brake System - [Link target (target-id 302672-) not found]
C0506	Antilock Brake System - [Link target (target-id 302606-) not found]
C0507	Antilock Brake System - [Link target (target-id 302606-) not found]
C0508	Antilock Brake System - [Link target (target-id 302606-) not found]
C0509	Antilock Brake System - [Link target (target-id 302606-) not found]
C050A	Antilock Brake System - [Link target (target-id 302606-) not found]
C050B	Antilock Brake System - [Link target (target-id 302672-) not found]
C050C	Antilock Brake System - [Link target (target-id 302606-) not found]
C050D	Antilock Brake System - [Link target (target-id 302606-) not found]
C050E	Antilock Brake System - [Link target (target-id 302606-) not found]
C050F	Antilock Brake System - [Link target (target-id 302606-) not found]
C0510	Antilock Brake System - [Link target (target-id 302606-) not found]
C0511	Antilock Brake System - [Link target (target-id 302672-) not found]

DTC	Diagnostic Procedure
C0512	Antilock Brake System - [Link target (target-id 302606-) not found]
C0513	Antilock Brake System - [Link target (target-id 302606-) not found]
C0514	Antilock Brake System - [Link target (target-id 302606-) not found]
C0515	Antilock Brake System - [Link target (target-id 302606-) not found]
C0516	Antilock Brake System - [Link target (target-id 302606-) not found]
C0517	Antilock Brake System - [Link target (target-id 302672-) not found]
C052B	Antilock Brake System - [Link target (target-id 349522-) not found]
C052C	Antilock Brake System - [Link target (target-id 349522-) not found]
C052D	Antilock Brake System - [Link target (target-id 349522-) not found]
C052E	Antilock Brake System - [Link target (target-id 349522-) not found]
C052F	Antilock Brake System - [Link target (target-id 349522-) not found]
C053B	Antilock Brake System - [Link target (target-id 307000-) not found]
C053D	Antilock Brake System - [Link target (target-id 302608-) not found]
C053E	Antilock Brake System - [Link target (target-id 302608-) not found]
C053F	Antilock Brake System - [Link target (target-id 302608-) not found]
C0546	Data Communications - [Link target (target-id 332895-) not found]
C0551	Antilock Brake System - [Link target (target-id 309335-) not found]
C0552	Antilock Brake System - [Link target (target-id 332586-) not found]
C0553	Antilock Brake System - [Link target (target-id 332586-) not found]
C0554	Antilock Brake System - [Link target (target-id 332586-) not found]
C0555	Antilock Brake System - [Link target (target-id 272226-) not found]
C0556	Antilock Brake System - [Link target (target-id 272226-) not found]
C0557	Antilock Brake System - [Link target (target-id 272226-) not found]
C0558	Antilock Brake System - [Link target (target-id 272226-) not found]
C0560	Antilock Brake System - [Link target (target-id 272227-) not found]
C0574	Antilock Brake System - [Link target (target-id 170998-) not found]
C059B	Antilock Brake System - [Link target (target-id 272227-) not found]
C05A3	Antilock Brake System - [Link target (target-id 272230-) not found]
C05A4	Antilock Brake System - [Link target (target-id 272230-) not found]
C05D5	Antilock Brake System - [Link target (target-id 302619-) not found]
C05D7	Shift Lock Control - [Link target (target-id 313637-) not found]
C05DD	Transfer Case - MP 1625/1626 - [Link target (target-id 354300-) not found]
C05DD	Transfer Case - MP 3023/3024 - [Link target (target-id 325245-) not found]
C05FB	Transfer Case - MP 1625/1626 - [Link target (target-id 317413-) not found]
C05FB	Transfer Case - MP 3023/3024 - [Link target (target-id 300827-) not found]
C05FF	Transfer Case - MP 1625/1626 - [Link target (target-id 327123-) not found]
C05FF	Transfer Case - MP 3023/3024 - [Link target (target-id 306749-) not found]
C0609	Park Brake - [Link target (target-id 302982-) not found]
C060B	Park Brake - [Link target (target-id 306987-) not found]
C0610	Park Brake - [Link target (target-id 306988-) not found]
C0616	Park Brake - [Link target (target-id 301674-) not found]
C0632	Transfer Case - MP 1625/1626 - [Link target (target-id 347185-) not found]

DTC	Diagnostic Procedure
C0632	Transfer Case - MP 3023/3024 - [Link target (target-id 347187-) not found]
C0697	Antilock Brake System - [Link target (target-id 332586-) not found]
C0698	Antilock Brake System - [Link target (target-id 332586-) not found]
C0699	Antilock Brake System - [Link target (target-id 332586-) not found]
C0710	Antilock Brake System - [Link target (target-id 64899-) not found]
C107D	Antilock Brake System - [Link target (target-id 320571-) not found]
C10BA	Transfer Case - MP 1625/1626 - [Link target (target-id 364462-) not found]
C10BA	Transfer Case - MP 3023/3024 - [Link target (target-id 364461-) not found]
C10DA	Lighting - [Link target (target-id 317493-) not found]
C10EE	Antilock Brake System - [Link target (target-id 304967-) not found]
C1114	Trailering Systems - [Link target (target-id 325998-) not found]
C1120	Antilock Brake System - [Link target (target-id 313580-) not found]
C1122	Antilock Brake System - [Link target (target-id 313580-) not found]
C1133	Frame and Underbody - [Link target (target-id 325183-) not found]
C1134	Frame and Underbody - [Link target (target-id 325183-) not found]
C114F	Steering Wheel and Column - [Link target (target-id 347270-) not found]
C1158	Trailering Systems - [Link target (target-id 326009-) not found]
C115E	Transfer Case - MP 1625/1626 - [Link target (target-id 354494-) not found]
C115E	Transfer Case - MP 3023/3024 - [Link target (target-id 325247-) not found]
C1162	Transfer Case - MP 1625/1626 - [Link target (target-id 354230-) not found]
C1162	Transfer Case - MP 3023/3024 - [Link target (target-id 309874-) not found]
C116B	Disc Brakes - [Link target (target-id 301556-) not found]
C116C	Disc Brakes - [Link target (target-id 301557-) not found]
C116D	Tire Pressure Monitoring - [Link target (target-id 313635-) not found]
C116E	Transfer Case - MP 1625/1626 - [Link target (target-id 354493-) not found]
C116E	Transfer Case - MP 3023/3024 - [Link target (target-id 325248-) not found]
C116F	Transfer Case - MP 1625/1626 - [Link target (target-id 364462-) not found]
C116F	Transfer Case - MP 3023/3024 - [Link target (target-id 364461-) not found]
C1170	Transfer Case - MP 1625/1626 - [Link target (target-id 354494-) not found]
C1170	Transfer Case - MP 3023/3024 - [Link target (target-id 325247-) not found]
C1171	Tire Pressure Monitoring - [Link target (target-id 314982-) not found]
C1171	Tire Pressure Monitoring - [Link target (target-id 348697-) not found]
C1172	Tire Pressure Monitoring - [Link target (target-id 314982-) not found]
C1172	Tire Pressure Monitoring - [Link target (target-id 348697-) not found]
C1173	Tire Pressure Monitoring - [Link target (target-id 314982-) not found]
C1173	Tire Pressure Monitoring - [Link target (target-id 348697-) not found]
C1174	Tire Pressure Monitoring - [Link target (target-id 314982-) not found]
C1174	Tire Pressure Monitoring - [Link target (target-id 348697-) not found]
C1178	Steering Wheel and Column - [Link target (target-id 315482-) not found]
C1180	Frame and Underbody - [Link target (target-id 328943-) not found]
C1181	Frame and Underbody - [Link target (target-id 328943-) not found]
C1182	Frame and Underbody - [Link target (target-id 328943-) not found]

DTC	Diagnostic Procedure
C1183	Frame and Underbody - [Link target (target-id 328943-) not found]
C119C	Transfer Case - MP 1625/1626 - [Link target (target-id 364462-) not found]
C119C	Transfer Case - MP 3023/3024 - [Link target (target-id 364461-) not found]
C119F	Tire Pressure Monitoring - [Link target (target-id 348697-) not found]
C11A0	Tire Pressure Monitoring - [Link target (target-id 348697-) not found]
C11A4	Transfer Case - MP 1625/1626 - [Link target (target-id 317418-) not found]
C11A4	Transfer Case - MP 3023/3024 - [Link target (target-id 300372-) not found]
C11A5	Rear Drive Axle - [Link target (target-id 282300-) not found]
C11A9	Transfer Case - MP 1625/1626 - [Link target (target-id 347177-) not found]
C11A9	Transfer Case - MP 3023/3024 - [Link target (target-id 327124-) not found]
C11AD	Transfer Case - MP 1625/1626 - [Link target (target-id 354365-) not found]
C11AD	Transfer Case - MP 3023/3024 - [Link target (target-id 300375-) not found]
C11B3	Transfer Case - MP 1625/1626 - [Link target (target-id 354353-) not found]
C11B3	Transfer Case - MP 3023/3024 - [Link target (target-id 300378-) not found]
C11B9	Transfer Case - MP 1625/1626 - [Link target (target-id 317413-) not found]
C11B9	Transfer Case - MP 3023/3024 - [Link target (target-id 300827-) not found]
C1207	Antilock Brake System - [Link target (target-id 196499-) not found]
C1208	Antilock Brake System - [Link target (target-id 196499-) not found]
C1209	Antilock Brake System - [Link target (target-id 196499-) not found]
C120A	Antilock Brake System - [Link target (target-id 196499-) not found]
C120B	Antilock Brake System - [Link target (target-id 196499-) not found]
C120C	Antilock Brake System - [Link target (target-id 196499-) not found]
C120D	Antilock Brake System - [Link target (target-id 196499-) not found]
C120E	Antilock Brake System - [Link target (target-id 196499-) not found]
C120F	Antilock Brake System - [Link target (target-id 196499-) not found]
C1210	Antilock Brake System - [Link target (target-id 196499-) not found]
C1211	Antilock Brake System - [Link target (target-id 1550-) not found]
C1221	Antilock Brake System - [Link target (target-id 196499-) not found]
C1222	Antilock Brake System - [Link target (target-id 196499-) not found]
C1223	Antilock Brake System - [Link target (target-id 196499-) not found]
C1224	Antilock Brake System - [Link target (target-id 196499-) not found]
C1225	Antilock Brake System - [Link target (target-id 196499-) not found]
C1226	Antilock Brake System - [Link target (target-id 196499-) not found]
C1227	Antilock Brake System - [Link target (target-id 196499-) not found]
C1228	Antilock Brake System - [Link target (target-id 196499-) not found]
C122E	Antilock Brake System - [Link target (target-id 186369-) not found]
C1232	Antilock Brake System - [Link target (target-id 196499-) not found]
C1233	Antilock Brake System - [Link target (target-id 196499-) not found]
C1234	Antilock Brake System - [Link target (target-id 196499-) not found]
C1235	Antilock Brake System - [Link target (target-id 196499-) not found]
C124F	Antilock Brake System - [Link target (target-id 228994-) not found]
C1250	Antilock Brake System - [Link target (target-id 228994-) not found]

DTC	Diagnostic Procedure
C1251	Antilock Brake System - [Link target (target-id 228994-) not found]
C1252	Antilock Brake System - [Link target (target-id 267540-) not found]
C1253	Antilock Brake System - [Link target (target-id 267540-) not found]
C1254	Antilock Brake System - [Link target (target-id 267540-) not found]
C1255	Antilock Brake System - [Link target (target-id 1571-) not found]
C1256	Antilock Brake System - [Link target (target-id 1571-) not found]
C1304	Lighting - [Link target (target-id 317495-) not found]
C1309	Rear Drive Axle - [Link target (target-id 282303-) not found]
C158C	Power Steering - [Link target (target-id 273702-) not found]
C1595	Trailering Systems - [Link target (target-id 326013-) not found]
C1596	Trailering Systems - [Link target (target-id 326014-) not found]
C159A	Rear Drive Axle - [Link target (target-id 282305-) not found]
C159C	Trailering Systems - [Link target (target-id 326015-) not found]
C159D	Trailering Systems - [Link target (target-id 326016-) not found]
C159E	Trailering Systems - [Link target (target-id 326016-) not found]
C159F	Trailering Systems - [Link target (target-id 326016-) not found]
C15A0	Trailering Systems - [Link target (target-id 326016-) not found]
C15A1	Trailering Systems - [Link target (target-id 326016-) not found]
C15A2	Trailering Systems - [Link target (target-id 326016-) not found]
C15A3	Parking Assistance Systems - [Link target (target-id 310221-) not found]
C15A6	Trailering Systems - [Link target (target-id 326017-) not found]
C15A9	Transfer Case - MP 1625/1626 - [Link target (target-id 354353-) not found]
C15A9	Transfer Case - MP 3023/3024 - [Link target (target-id 300378-) not found]
C15AA	Transfer Case - MP 1625/1626 - [Link target (target-id 354365-) not found]
C15AA	Transfer Case - MP 3023/3024 - [Link target (target-id 300375-) not found]
C15AB	Transfer Case - MP 1625/1626 - [Link target (target-id 317413-) not found]
C15AB	Transfer Case - MP 3023/3024 - [Link target (target-id 300827-) not found]
C15AC	Transfer Case - MP 1625/1626 - [Link target (target-id 327123-) not found]
C15AC	Transfer Case - MP 3023/3024 - [Link target (target-id 306749-) not found]
C15C1	Transfer Case - MP 1625/1626 - [Link target (target-id 317413-) not found]
C15C1	Transfer Case - MP 3023/3024 - [Link target (target-id 300827-) not found]
C15C6	Antilock Brake System - [Link target (target-id 307843-) not found]
C15C8	Power Steering - [Link target (target-id 310817-) not found]
C15DD	Park Brake - [Link target (target-id 319157-) not found]
C2A07	Antilock Brake System - [Link target (target-id 302623-) not found]
C2A08	Antilock Brake System - [Link target (target-id 309963-) not found]
C2A08	Antilock Brake System - [Link target (target-id 302624-) not found]
C2A09	Antilock Brake System - [Link target (target-id 302624-) not found]
C2A0A	Antilock Brake System - [Link target (target-id 302624-) not found]
C2A15	Antilock Brake System - [Link target (target-id 307845-) not found]
C2A16	Antilock Brake System - [Link target (target-id 307845-) not found]
C2A21	Antilock Brake System - [Link target (target-id 307848-) not found]

DTC	Diagnostic Procedure
C2A3D	Antilock Brake System - [Link target (target-id 324294-) not found]
P0010	Engine Controls and Fuel - 6.6L - [Link target (target-id 294312-) not found]
P0011	Engine Controls and Fuel - 6.6L - [Link target (target-id 294312-) not found]
P0016	Engine Controls and Fuel - 6.6L - [Link target (target-id 228017-) not found]
P0016	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186657-) not found]
P0030	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0031	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0032	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0036	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0037	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0038	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P003A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 327766-) not found]
P0046	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 333291-) not found]
P0050	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0051	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0052	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0053	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0054	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0056	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0057	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0058	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0059	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P005A	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P005B	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P005C	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P005D	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P005E	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P005F	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0060	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0068	Engine Controls and Fuel - 6.6L - [Link target (target-id 333303-) not found]
P0070	Displays and Gauges - [Link target (target-id 272557-) not found]
P0071	Displays and Gauges - [Link target (target-id 268233-) not found]
P0072	Displays and Gauges - [Link target (target-id 268233-) not found]
P0073	Displays and Gauges - [Link target (target-id 268233-) not found]
P0074	Displays and Gauges - [Link target (target-id 268233-) not found]
P007B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321214-) not found]
P007C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321215-) not found]
P007D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321215-) not found]
P007E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321215-) not found]
P0087	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]
P0089	Engine Controls and Fuel - 6.6L - [Link target (target-id 297085-) not found]
P0089	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]

DTC	Diagnostic Procedure
P0090	Engine Controls and Fuel - 6.6L - [Link target (target-id 329292-) not found]
P0090	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P0091	Engine Controls and Fuel - 6.6L - [Link target (target-id 329292-) not found]
P0091	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P0092	Engine Controls and Fuel - 6.6L - [Link target (target-id 329292-) not found]
P0092	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P0096	Engine Controls and Fuel - 6.6L - [Link target (target-id 228194-) not found]
P0096	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 305002-) not found]
P0097	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P0097	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P0098	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P0098	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P0099	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P0099	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P00AF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 285263-) not found]
P00C6	Engine Controls and Fuel - 6.6L - [Link target (target-id 297085-) not found]
P00C7	Engine Controls and Fuel - 6.6L - [Link target (target-id 266248-) not found]
P00C7	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348347-) not found]
P00C9	Engine Controls and Fuel - 6.6L - [Link target (target-id 329292-) not found]
P00C9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P00CA	Engine Controls and Fuel - 6.6L - [Link target (target-id 329292-) not found]
P00CA	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P00E9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 305002-) not found]
P00EA	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283936-) not found]
P00EB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283936-) not found]
P00EC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283936-) not found]
P00F4	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P00F4	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P00F5	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P00F5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P00F6	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P00F6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P00FF	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P00FF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P0101	Engine Controls and Fuel - 6.6L - [Link target (target-id 333303-) not found]
P0101	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186664-) not found]
P0102	Engine Controls and Fuel - 6.6L - [Link target (target-id 362305-) not found]
P0102	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 355448-) not found]
P0103	Engine Controls and Fuel - 6.6L - [Link target (target-id 362305-) not found]
P0103	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 355448-) not found]
P0106	Engine Controls and Fuel - 6.6L - [Link target (target-id 333303-) not found]
P0106	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 305004-) not found]

DTC	Diagnostic Procedure
P0107	Engine Controls and Fuel - 6.6L - [Link target (target-id 228008-) not found]
P0107	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 305004-) not found]
P0108	Engine Controls and Fuel - 6.6L - [Link target (target-id 228008-) not found]
P0108	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 305004-) not found]
P0111	Engine Controls and Fuel - 6.6L - [Link target (target-id 228194-) not found]
P0111	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 305002-) not found]
P0112	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P0112	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P0113	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P0113	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P0114	Engine Controls and Fuel - 6.6L - [Link target (target-id 306991-) not found]
P0114	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348727-) not found]
P0116	Engine Controls and Fuel - 6.6L - [Link target (target-id 301554-) not found]
P0117	Engine Controls and Fuel - 6.6L - [Link target (target-id 301554-) not found]
P0118	Engine Controls and Fuel - 6.6L - [Link target (target-id 301554-) not found]
P0119	Engine Controls and Fuel - 6.6L - [Link target (target-id 301554-) not found]
P0121	Engine Controls and Fuel - 6.6L - [Link target (target-id 333303-) not found]
P0122	Engine Controls and Fuel - 6.6L - [Link target (target-id 332809-) not found]
P0123	Engine Controls and Fuel - 6.6L - [Link target (target-id 332809-) not found]
P0128	Engine Controls and Fuel - 6.6L - [Link target (target-id 301562-) not found]
P0131	Engine Controls and Fuel - 6.6L - [Link target (target-id 227954-) not found]
P0132	Engine Controls and Fuel - 6.6L - [Link target (target-id 227954-) not found]
P0135	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0137	Engine Controls and Fuel - 6.6L - [Link target (target-id 227954-) not found]
P0138	Engine Controls and Fuel - 6.6L - [Link target (target-id 227954-) not found]
P013A	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P013B	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P013C	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P013D	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P013E	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P013F	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P0141	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P014A	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P014B	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P0151	Engine Controls and Fuel - 6.6L - [Link target (target-id 227954-) not found]
P0152	Engine Controls and Fuel - 6.6L - [Link target (target-id 227954-) not found]
P0155	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0157	Engine Controls and Fuel - 6.6L - [Link target (target-id 227954-) not found]
P0158	Engine Controls and Fuel - 6.6L - [Link target (target-id 227954-) not found]
P015A	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P015B	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P015C	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]

DTC	Diagnostic Procedure
P015D	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P0161	Engine Controls and Fuel - 6.6L - [Link target (target-id 228057-) not found]
P0171	Engine Controls and Fuel - 6.6L - [Link target (target-id 227792-) not found]
P0172	Engine Controls and Fuel - 6.6L - [Link target (target-id 227792-) not found]
P0174	Engine Controls and Fuel - 6.6L - [Link target (target-id 227792-) not found]
P0175	Engine Controls and Fuel - 6.6L - [Link target (target-id 227792-) not found]
P0178	Engine Controls and Fuel - 6.6L - [Link target (target-id 333292-) not found]
P0179	Engine Controls and Fuel - 6.6L - [Link target (target-id 333292-) not found]
P0181	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278967-) not found]
P0182	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278967-) not found]
P0183	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278967-) not found]
P0184	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278967-) not found]
P0186	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 346921-) not found]
P018B	Engine Controls and Fuel - 6.6L - [Link target (target-id 227846-) not found]
P018B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278968-) not found]
P018C	Engine Controls and Fuel - 6.6L - [Link target (target-id 227846-) not found]
P018C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278968-) not found]
P018D	Engine Controls and Fuel - 6.6L - [Link target (target-id 227846-) not found]
P018D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278968-) not found]
P0191	Engine Controls and Fuel - 6.6L - [Link target (target-id 316948-) not found]
P0191	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 346921-) not found]
P0192	Engine Controls and Fuel - 6.6L - [Link target (target-id 316948-) not found]
P0192	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 346921-) not found]
P0193	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 346921-) not found]
P0196	Displays and Gauges - [Link target (target-id 309839-) not found]
P0197	Displays and Gauges - [Link target (target-id 309839-) not found]
P0198	Displays and Gauges - [Link target (target-id 309839-) not found]
P0199	Displays and Gauges - [Link target (target-id 309839-) not found]
P01CB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01CC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01CD	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01CE	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01CF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D0	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D1	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D2	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D3	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D4	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D7	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01D8	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]

DTC	Diagnostic Procedure
P01D9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01DA	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 298335-) not found]
P01F0	Engine Controls and Fuel - 6.6L - [Link target (target-id 301562-) not found]
P0201	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0201	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0202	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0202	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0203	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0203	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0204	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0204	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0205	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0205	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0206	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0206	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0207	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0207	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0208	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0208	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P020A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278970-) not found]
P020B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278970-) not found]
P020C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278970-) not found]
P020D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278970-) not found]
P020E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278970-) not found]
P020F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278970-) not found]
P0216	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278971-) not found]
P021A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278970-) not found]
P021B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278970-) not found]
P0222	Engine Controls and Fuel - 6.6L - [Link target (target-id 332809-) not found]
P0223	Engine Controls and Fuel - 6.6L - [Link target (target-id 332809-) not found]
P0234	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 290825-) not found]
P0261	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0261	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0262	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0262	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0264	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0264	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0265	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0265	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0267	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0267	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0268	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]

DTC	Diagnostic Procedure
P0268	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P026A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 196096-) not found]
P026B	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P026B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P026C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 224204-) not found]
P026D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 224204-) not found]
P0270	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0270	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0271	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0271	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0273	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0273	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0274	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0274	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0276	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0276	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0277	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0277	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0279	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0279	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0280	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0280	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0282	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0282	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0283	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P0283	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P0299	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 290825-) not found]
P02CC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02CD	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02CE	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02CF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D0	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D1	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D2	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D3	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D4	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D7	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D8	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02D9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02DA	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]

DTC	Diagnostic Procedure
P02DB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278973-) not found]
P02E0	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349316-) not found]
P02E1	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 297156-) not found]
P02E2	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349316-) not found]
P02E3	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349316-) not found]
P02E5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 297156-) not found]
P02E8	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 319639-) not found]
P02E9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 319639-) not found]
P02EB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349316-) not found]
P02EE	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P02EF	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P02F0	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P02F1	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P02F2	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P02F3	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P02F4	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P02F5	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P0300	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0300	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0301	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0301	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0302	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0302	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0303	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0303	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0304	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0304	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0305	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0305	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0306	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0306	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0307	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0307	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0308	Engine Controls and Fuel - 6.6L - [Link target (target-id 227972-) not found]
P0308	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186686-) not found]
P0315	Engine Controls and Fuel - 6.6L - [Link target (target-id 227702-) not found]
P0315	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 203866-) not found]
P0324	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P0325	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P0326	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P0327	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P0328	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]

DTC	Diagnostic Procedure
P0330	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P0331	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P0332	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P0333	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P0335	Engine Controls and Fuel - 6.6L - [Link target (target-id 227797-) not found]
P0335	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186688-) not found]
P0336	Engine Controls and Fuel - 6.6L - [Link target (target-id 227797-) not found]
P0336	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186688-) not found]
P0340	Engine Controls and Fuel - 6.6L - [Link target (target-id 227862-) not found]
P0340	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186691-) not found]
P0341	Engine Controls and Fuel - 6.6L - [Link target (target-id 227862-) not found]
P0341	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186691-) not found]
P0351	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P0352	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P0353	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P0354	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P0355	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P0356	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P0357	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P0358	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P037A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306997-) not found]
P037B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306997-) not found]
P037E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348340-) not found]
P037F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348340-) not found]
P0381	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306997-) not found]
P0420	Engine Controls and Fuel - 6.6L - [Link target (target-id 227870-) not found]
P0430	Engine Controls and Fuel - 6.6L - [Link target (target-id 227870-) not found]
P0442	Engine Controls and Fuel - 6.6L - [Link target (target-id 302583-) not found]
P0443	Engine Controls and Fuel - 6.6L - [Link target (target-id 253845-) not found]
P0446	Engine Controls and Fuel - 6.6L - [Link target (target-id 227750-) not found]
P0449	Engine Controls and Fuel - 6.6L - [Link target (target-id 253846-) not found]
P0451	Engine Controls and Fuel - 6.6L - [Link target (target-id 227716-) not found]
P0452	Engine Controls and Fuel - 6.6L - [Link target (target-id 227716-) not found]
P0453	Engine Controls and Fuel - 6.6L - [Link target (target-id 227716-) not found]
P0454	Engine Controls and Fuel - 6.6L - [Link target (target-id 227716-) not found]
P0455	Engine Controls and Fuel - 6.6L - [Link target (target-id 302583-) not found]
P0458	Engine Controls and Fuel - 6.6L - [Link target (target-id 253845-) not found]
P0459	Engine Controls and Fuel - 6.6L - [Link target (target-id 253845-) not found]
P0461	Displays and Gauges - [Link target (target-id 192567-) not found]
P0462	Displays and Gauges - [Link target (target-id 192567-) not found]
P0463	Displays and Gauges - [Link target (target-id 192567-) not found]
P0464	Displays and Gauges - [Link target (target-id 192567-) not found]

DTC	Diagnostic Procedure
P0496	Engine Controls and Fuel - 6.6L - [Link target (target-id 227884-) not found]
P0498	Engine Controls and Fuel - 6.6L - [Link target (target-id 253846-) not found]
P0499	Engine Controls and Fuel - 6.6L - [Link target (target-id 253846-) not found]
P04DB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320806-) not found]
P04E2	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320806-) not found]
P04E3	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320806-) not found]
P04FB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320806-) not found]
P0506	Engine Controls and Fuel - 6.6L - [Link target (target-id 227941-) not found]
P0506	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186701-) not found]
P0507	Engine Controls and Fuel - 6.6L - [Link target (target-id 227941-) not found]
P0507	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186701-) not found]
P050D	Engine Controls and Fuel - 6.6L - [Link target (target-id 229167-) not found]
P0513	Immobilizer - [Link target (target-id 156476-) not found]
P0521	Displays and Gauges - [Link target (target-id 161095-) not found]
P0522	Displays and Gauges - [Link target (target-id 161095-) not found]
P0523	Displays and Gauges - [Link target (target-id 161095-) not found]
P0532	HVAC - Automatic - [Link target (target-id 69299-) not found]
P0532	HVAC - Manual - [Link target (target-id 75796-) not found]
P0533	HVAC - Automatic - [Link target (target-id 69299-) not found]
P0533	HVAC - Manual - [Link target (target-id 75796-) not found]
P0535	HVAC - Automatic - [Link target (target-id 317707-) not found]
P0535	HVAC - Manual - [Link target (target-id 337981-) not found]
P0537	HVAC - Automatic - [Link target (target-id 317707-) not found]
P0537	HVAC - Manual - [Link target (target-id 337981-) not found]
P0538	HVAC - Automatic - [Link target (target-id 317707-) not found]
P0538	HVAC - Manual - [Link target (target-id 337981-) not found]
P054E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 224999-) not found]
P054F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 224999-) not found]
P0560	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 303008-) not found]
P0561	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 303008-) not found]
P0562	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 303008-) not found]
P0563	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 303008-) not found]
P0564	Cruise Control - [Link target (target-id 355188-) not found]
P0565	Cruise Control - [Link target (target-id 355188-) not found]
P0567	Cruise Control - [Link target (target-id 355188-) not found]
P0568	Cruise Control - [Link target (target-id 355188-) not found]
P056C	Cruise Control - [Link target (target-id 355188-) not found]
P057B	Engine Controls and Fuel - 6.6L - [Link target (target-id 272841-) not found]
P057B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 285204-) not found]
P057C	Engine Controls and Fuel - 6.6L - [Link target (target-id 272841-) not found]
P057C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 285204-) not found]
P057D	Engine Controls and Fuel - 6.6L - [Link target (target-id 272841-) not found]

DTC	Diagnostic Procedure
P057D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 285204-) not found]
P057E	Engine Controls and Fuel - 6.6L - [Link target (target-id 272841-) not found]
P057E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 285204-) not found]
P0580	Cruise Control - [Link target (target-id 355188-) not found]
P0581	Cruise Control - [Link target (target-id 355188-) not found]
P0589	Cruise Control - [Link target (target-id 355188-) not found]
P058A	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314847-) not found]
P058B	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314847-) not found]
P058C	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314847-) not found]
P058D	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314847-) not found]
P058E	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314847-) not found]
P058F	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314847-) not found]
P0592	Cruise Control - [Link target (target-id 355188-) not found]
P0593	Cruise Control - [Link target (target-id 355188-) not found]
P059F	Bumpers and Fascias - [Link target (target-id 354234-) not found]
P05D1	Secondary and Configurable Customer Controls - [Link target (target-id 323238-) not found]
P05D2	Secondary and Configurable Customer Controls - [Link target (target-id 323238-) not found]
P05D3	Secondary and Configurable Customer Controls - [Link target (target-id 323238-) not found]
P05EC	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P05EC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0601	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0601	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0601	Data Communications - [Link target (target-id 272300-) not found]
P0601	Automatic Transmission - 10L1000 - [Link target (target-id 347965-) not found]
P0602	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0602	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0602	Data Communications - [Link target (target-id 272300-) not found]
P0602	Automatic Transmission - 10L1000 - [Link target (target-id 347965-) not found]
P0603	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0603	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0603	Data Communications - [Link target (target-id 272300-) not found]
P0603	Automatic Transmission - 10L1000 - [Link target (target-id 347965-) not found]
P0604	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0604	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0604	Data Communications - [Link target (target-id 272300-) not found]
P0604	Automatic Transmission - 10L1000 - [Link target (target-id 347965-) not found]
P0605	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0605	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0605	Data Communications - [Link target (target-id 272300-) not found]
P0606	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0606	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0606	Data Communications - [Link target (target-id 272300-) not found]

DTC	Diagnostic Procedure
P0606	Automatic Transmission - 10L1000 - [Link target (target-id 347965-) not found]
P0607	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0607	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0607	Data Communications - [Link target (target-id 272300-) not found]
P0607	Automatic Transmission - 10L1000 - [Link target (target-id 347965-) not found]
P060A	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P060A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P060A	Data Communications - [Link target (target-id 272300-) not found]
P060B	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P060B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P060B	Data Communications - [Link target (target-id 272300-) not found]
P060C	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P060C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P060C	Data Communications - [Link target (target-id 272300-) not found]
P060C	Automatic Transmission - 10L1000 - [Link target (target-id 347965-) not found]
P060D	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P060D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0610	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0610	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0610	Data Communications - [Link target (target-id 272300-) not found]
P0615	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 147526-) not found]
P0616	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 147526-) not found]
P0617	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 147526-) not found]
P061C	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P061C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0621	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 37806-) not found]
P0622	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 37807-) not found]
P0627	Engine Controls and Fuel - 6.6L - [Link target (target-id 327483-) not found]
P0627	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 325238-) not found]
P0628	Engine Controls and Fuel - 6.6L - [Link target (target-id 327483-) not found]
P0628	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 325238-) not found]
P0629	Engine Controls and Fuel - 6.6L - [Link target (target-id 327483-) not found]
P0629	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 325238-) not found]
P062B	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P062B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P062D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 297105-) not found]
P062F	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P062F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P062F	Data Communications - [Link target (target-id 272300-) not found]
P062F	Automatic Transmission - 10L1000 - [Link target (target-id 347965-) not found]
P0630	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P0630	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]

DTC	Diagnostic Procedure
P0630	Data Communications - [Link target (target-id 272300-) not found]
P0633	Immobilizer - [Link target (target-id 142528-) not found]
P0634	Data Communications - [Link target (target-id 272300-) not found]
P0641	Antilock Brake System - [Link target (target-id 359723-) not found]
P0641	Engine Controls and Fuel - 6.6L - [Link target (target-id 227878-) not found]
P0641	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 286418-) not found]
P0641	Wiring Systems and Power Management - [Link target (target-id 327177-) not found]
P0645	HVAC - Automatic - [Link target (target-id 69300-) not found]
P0645	HVAC - Manual - [Link target (target-id 119567-) not found]
P0646	HVAC - Automatic - [Link target (target-id 69300-) not found]
P0646	HVAC - Manual - [Link target (target-id 119567-) not found]
P0647	HVAC - Automatic - [Link target (target-id 69300-) not found]
P0647	HVAC - Manual - [Link target (target-id 119567-) not found]
P064D	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P064D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P064E	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P064E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P064F	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P064F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P064F	Data Communications - [Link target (target-id 272300-) not found]
P0651	Antilock Brake System - [Link target (target-id 359723-) not found]
P0651	Engine Controls and Fuel - 6.6L - [Link target (target-id 227878-) not found]
P0651	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 286418-) not found]
P0651	Wiring Systems and Power Management - [Link target (target-id 327177-) not found]
P0658	Automatic Transmission - 10L1000 - [Link target (target-id 315059-) not found]
P0659	Automatic Transmission - 10L1000 - [Link target (target-id 315059-) not found]
P066A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P066B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P066C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P066D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P066E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P066F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0671	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0672	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0673	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0674	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0675	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0676	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0677	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0678	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P067A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P067B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]

DTC	Diagnostic Procedure
P067C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P067D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P067E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P067F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0685	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P0685	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P0686	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P0686	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P0687	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P0687	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P0689	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P0689	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P068C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P068D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P068E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P068F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278975-) not found]
P0690	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P0690	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P0697	Antilock Brake System - [Link target (target-id 359723-) not found]
P0697	Engine Controls and Fuel - 6.6L - [Link target (target-id 227878-) not found]
P0697	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 286418-) not found]
P0697	Wiring Systems and Power Management - [Link target (target-id 327177-) not found]
P069E	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P069E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P06A3	Antilock Brake System - [Link target (target-id 359723-) not found]
P06A3	Engine Controls and Fuel - 6.6L - [Link target (target-id 227878-) not found]
P06A3	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 286418-) not found]
P06A3	Wiring Systems and Power Management - [Link target (target-id 327177-) not found]
P06AF	Engine Controls and Fuel - 6.6L - [Link target (target-id 327557-) not found]
P06B6	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P06B7	Engine Controls and Fuel - 6.6L - [Link target (target-id 227713-) not found]
P06B8	Data Communications - [Link target (target-id 272300-) not found]
P06C5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278976-) not found]
P06C6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278976-) not found]
P06C7	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278976-) not found]
P06C8	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278976-) not found]
P06C9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278976-) not found]
P06CA	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278976-) not found]
P06CB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278976-) not found]
P06CC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278976-) not found]
P06D1	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P06D1	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]

DTC	Diagnostic Procedure
P06DA	Engine Mechanical - 6.6L - [Link target (target-id 294343-) not found]
P06DB	Engine Mechanical - 6.6L - [Link target (target-id 294343-) not found]
P06DC	Engine Mechanical - 6.6L - [Link target (target-id 294343-) not found]
P06DD	Engine Mechanical - 6.6L - [Link target (target-id 294343-) not found]
P06EC	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P06EC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P0700	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P0700	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P0707	Automatic Transmission - 10L1000 - [Link target (target-id 315244-) not found]
P0708	Automatic Transmission - 10L1000 - [Link target (target-id 315244-) not found]
P0711	Automatic Transmission - 10L1000 - [Link target (target-id 315060-) not found]
P0712	Automatic Transmission - 10L1000 - [Link target (target-id 315060-) not found]
P0713	Automatic Transmission - 10L1000 - [Link target (target-id 315060-) not found]
P0716	Automatic Transmission - 10L1000 - [Link target (target-id 315124-) not found]
P0717	Automatic Transmission - 10L1000 - [Link target (target-id 315124-) not found]
P0721	Automatic Transmission - 10L1000 - [Link target (target-id 319777-) not found]
P0722	Automatic Transmission - 10L1000 - [Link target (target-id 319777-) not found]
P0723	Automatic Transmission - 10L1000 - [Link target (target-id 319777-) not found]
P0741	Automatic Transmission - 10L1000 - [Link target (target-id 315229-) not found]
P0746	Automatic Transmission - 10L1000 - [Link target (target-id 315082-) not found]
P0747	Automatic Transmission - 10L1000 - [Link target (target-id 315082-) not found]
P0776	Automatic Transmission - 10L1000 - [Link target (target-id 315079-) not found]
P0777	Automatic Transmission - 10L1000 - [Link target (target-id 315079-) not found]
P077C	Automatic Transmission - 10L1000 - [Link target (target-id 319777-) not found]
P077D	Automatic Transmission - 10L1000 - [Link target (target-id 319777-) not found]
P0796	Automatic Transmission - 10L1000 - [Link target (target-id 315074-) not found]
P0797	Automatic Transmission - 10L1000 - [Link target (target-id 315074-) not found]
P07BF	Automatic Transmission - 10L1000 - [Link target (target-id 315124-) not found]
P07C0	Automatic Transmission - 10L1000 - [Link target (target-id 315124-) not found]
P0800	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P0800	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P0815	Automatic Transmission - 10L1000 - [Link target (target-id 351897-) not found]
P0816	Automatic Transmission - 10L1000 - [Link target (target-id 351897-) not found]
P0826	Automatic Transmission - 10L1000 - [Link target (target-id 351897-) not found]
P0856	Antilock Brake System - [Link target (target-id 165434-) not found]
P08FF	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P08FF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P0960	Automatic Transmission - 10L1000 - [Link target (target-id 315234-) not found]
P0962	Automatic Transmission - 10L1000 - [Link target (target-id 315234-) not found]
P0963	Automatic Transmission - 10L1000 - [Link target (target-id 315234-) not found]
P0964	Automatic Transmission - 10L1000 - [Link target (target-id 315061-) not found]
P0966	Automatic Transmission - 10L1000 - [Link target (target-id 315061-) not found]

DTC	Diagnostic Procedure
P0967	Automatic Transmission - 10L1000 - [Link target (target-id 315061-) not found]
P0968	Automatic Transmission - 10L1000 - [Link target (target-id 315024-) not found]
P0970	Automatic Transmission - 10L1000 - [Link target (target-id 315024-) not found]
P0971	Automatic Transmission - 10L1000 - [Link target (target-id 315024-) not found]
P0A7B	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P0A7B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P0AC4	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P0AC4	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P0CA1	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P0CA1	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P0F34	Engine Controls and Fuel - 6.6L - [Link target (target-id 349585-) not found]
P0F35	Engine Controls and Fuel - 6.6L - [Link target (target-id 349585-) not found]
P0F36	Engine Controls and Fuel - 6.6L - [Link target (target-id 349585-) not found]
P0F37	Engine Controls and Fuel - 6.6L - [Link target (target-id 349586-) not found]
P0F38	Engine Controls and Fuel - 6.6L - [Link target (target-id 349586-) not found]
P1002	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 313528-) not found]
P1005	Engine Controls and Fuel - 6.6L - [Link target (target-id 309964-) not found]
P1005	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 293625-) not found]
P1007	Engine Controls and Fuel - 6.6L - [Link target (target-id 309965-) not found]
P1007	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278977-) not found]
P100B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 327766-) not found]
P100C	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 280530-) not found]
P100D	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 280530-) not found]
P1029	Engine Controls and Fuel - 6.6L - [Link target (target-id 327484-) not found]
P1029	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348341-) not found]
P102A	Engine Controls and Fuel - 6.6L - [Link target (target-id 327484-) not found]
P102A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348341-) not found]
P102B	Engine Controls and Fuel - 6.6L - [Link target (target-id 327484-) not found]
P102B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348341-) not found]
P1037	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278984-) not found]
P103D	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P103D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P1089	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 224205-) not found]
P10BC	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P10C6	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P10C6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P10CD	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348402-) not found]
P10CE	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348402-) not found]
P10D5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321214-) not found]
P10D6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321215-) not found]
P10D7	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321215-) not found]
P10D8	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321215-) not found]

DTC	Diagnostic Procedure
P10F4	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320805-) not found]
P10F5	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P10F5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P1100	Displays and Gauges - [Link target (target-id 280600-) not found]
P1101	Engine Controls and Fuel - 6.6L - [Link target (target-id 333303-) not found]
P1176	Engine Controls and Fuel - 6.6L - [Link target (target-id 304085-) not found]
P1177	Engine Controls and Fuel - 6.6L - [Link target (target-id 304085-) not found]
P1177	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 321302-) not found]
P117A	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P117A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P1199	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348347-) not found]
P11FF	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P11FF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P1200	Displays and Gauges - [Link target (target-id 280601-) not found]
P122B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349316-) not found]
P122C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349316-) not found]
P122D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 203884-) not found]
P1248	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P1248	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P1249	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P1249	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P124A	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P124A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P124B	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P124B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P124C	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P124C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P124D	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P124D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P124E	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P124E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P124F	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P124F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P1255	Engine Controls and Fuel - 6.6L - [Link target (target-id 227882-) not found]
P1255	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278986-) not found]
P127C	Engine Controls and Fuel - 6.6L - [Link target (target-id 316948-) not found]
P127C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 346921-) not found]
P127D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 346921-) not found]
P128A	Engine Controls and Fuel - 6.6L - [Link target (target-id 316948-) not found]
P128B	Engine Controls and Fuel - 6.6L - [Link target (target-id 316948-) not found]
P128C	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P128C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]

DTC	Diagnostic Procedure
P128D	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P128D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P128F	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P128F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P129B	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 182379-) not found]
P129C	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 182379-) not found]
P129D	Engine Controls and Fuel - 6.6L - [Link target (target-id 309965-) not found]
P129D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278977-) not found]
P129F	Engine Controls and Fuel - 6.6L - [Link target (target-id 227990-) not found]
P129F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278988-) not found]
P12A6	Engine Controls and Fuel - 6.6L - [Link target (target-id 327483-) not found]
P12A6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 325238-) not found]
P134C	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P134C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P135A	Engine Controls and Fuel - 6.6L - [Link target (target-id 228219-) not found]
P135B	Engine Controls and Fuel - 6.6L - [Link target (target-id 228219-) not found]
P135C	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P135C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P1400	Engine Controls and Fuel - 6.6L - [Link target (target-id 227952-) not found]
P1425	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349316-) not found]
P1434	Displays and Gauges - [Link target (target-id 280602-) not found]
P143E	Displays and Gauges - [Link target (target-id 280603-) not found]
P1465	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 304031-) not found]
P1466	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 304031-) not found]
P14A0	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P14A0	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P14B6	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P14B6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P14CD	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P14CD	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P14D4	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P14D4	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P14D5	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P14D5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P14D6	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P14D6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P14E7	Power Take-Off - [Link target (target-id 320478-) not found]
P14E8	Power Take-Off - [Link target (target-id 320478-) not found]
P14E9	Power Take-Off - [Link target (target-id 320479-) not found]
P14EA	Power Take-Off - [Link target (target-id 320479-) not found]
P14EB	Power Take-Off - [Link target (target-id 320479-) not found]
P14EC	Power Take-Off - [Link target (target-id 320479-) not found]

DTC	Diagnostic Procedure
P14ED	Power Take-Off - [Link target (target-id 320479-) not found]
P150C	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P150C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P1516	Engine Controls and Fuel - 6.6L - [Link target (target-id 227727-) not found]
P153B	HVAC - Automatic - [Link target (target-id 317707-) not found]
P153B	HVAC - Manual - [Link target (target-id 337981-) not found]
P155A	Cruise Control - [Link target (target-id 355188-) not found]
P155B	Cruise Control - [Link target (target-id 355188-) not found]
P155C	Cruise Control - [Link target (target-id 355188-) not found]
P157A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 327162-) not found]
P158F	Power Take-Off - [Link target (target-id 280594-) not found]
P159A	Power Take-Off - [Link target (target-id 359800-) not found]
P159C	Power Take-Off - [Link target (target-id 164885-) not found]
P159D	Power Take-Off - [Link target (target-id 265884-) not found]
P15F6	Driver Assistance Systems - [Link target (target-id 283689-) not found]
P15F8	Antilock Brake System - [Link target (target-id 227356-) not found]
P15FD	Antilock Brake System - [Link target (target-id 272641-) not found]
P15FF	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 272217-) not found]
P160A	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P160A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P160D	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P160D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P160E	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P160E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P161C	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P161C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P162B	Immobilizer - [Link target (target-id 184943-) not found]
P162C	Cruise Control - [Link target (target-id 355188-) not found]
P1631	Immobilizer - [Link target (target-id 59387-) not found]
P163A	Engine Controls and Fuel - 6.6L - [Link target (target-id 329292-) not found]
P163A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P163B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P1649	Immobilizer - [Link target (target-id 159966-) not found]
P1682	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P1682	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P16A7	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P16A7	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P16AF	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P16AF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P16B3	Engine Controls and Fuel - 6.6L - [Link target (target-id 319596-) not found]
P16B3	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P16BC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]

DTC	Diagnostic Procedure
P16BD	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P16BF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 354217-) not found]
P16D4	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314848-) not found]
P16D5	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314848-) not found]
P16D6	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314848-) not found]
P16D7	Engine Controls and Fuel - 6.6L - [Link target (target-id 327488-) not found]
P16D7	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 327162-) not found]
P16D8	Engine Controls and Fuel - 6.6L - [Link target (target-id 327488-) not found]
P16D8	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 327162-) not found]
P16D9	Engine Controls and Fuel - 6.6L - [Link target (target-id 327488-) not found]
P16D9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 327162-) not found]
P16E1	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314850-) not found]
P16E2	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314850-) not found]
P16E3	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 314850-) not found]
P16E9	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16E9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P16E9	Data Communications - [Link target (target-id 272300-) not found]
P16EA	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16EA	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P16EA	Data Communications - [Link target (target-id 272300-) not found]
P16EB	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16EB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P16EB	Data Communications - [Link target (target-id 272300-) not found]
P16EC	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16EC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P16EC	Data Communications - [Link target (target-id 272300-) not found]
P16ED	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16ED	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P16ED	Data Communications - [Link target (target-id 272300-) not found]
P16EE	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16EE	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P16EE	Data Communications - [Link target (target-id 272300-) not found]
P16EF	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16EF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P16EF	Data Communications - [Link target (target-id 272300-) not found]
P16F0	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16F0	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P16F0	Data Communications - [Link target (target-id 272300-) not found]
P16F1	Data Communications - [Link target (target-id 272300-) not found]
P16F2	Data Communications - [Link target (target-id 272300-) not found]
P16F3	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P16F3	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]

DTC	Diagnostic Procedure
P16F3	Data Communications - [Link target (target-id 272300-) not found]
P16F9	Data Communications - [Link target (target-id 272300-) not found]
P16FD	Data Communications - [Link target (target-id 272300-) not found]
P16FE	Data Communications - [Link target (target-id 272300-) not found]
P1700	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P1700	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P172A	Automatic Transmission - 10L1000 - [Link target (target-id 319777-) not found]
P175E	Automatic Transmission - 10L1000 - [Link target (target-id 315224-) not found]
P1762	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P1762	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P176B	Automatic Transmission - 10L1000 - [Link target (target-id 315007-) not found]
P176C	Automatic Transmission - 10L1000 - [Link target (target-id 315007-) not found]
P176D	Automatic Transmission - 10L1000 - [Link target (target-id 315007-) not found]
P1783	Automatic Transmission - 10L1000 - [Link target (target-id 315124-) not found]
P178F	Automatic Transmission - 10L1000 - [Link target (target-id 315007-) not found]
P17C5	Automatic Transmission - 10L1000 - [Link target (target-id 315098-) not found]
P17C6	Automatic Transmission - 10L1000 - [Link target (target-id 315098-) not found]
P17CC	Automatic Transmission - 10L1000 - [Link target (target-id 315098-) not found]
P17CD	Automatic Transmission - 10L1000 - [Link target (target-id 315098-) not found]
P17CE	Automatic Transmission - 10L1000 - [Link target (target-id 315124-) not found]
P17D3	Automatic Transmission - 10L1000 - [Link target (target-id 315007-) not found]
P17D4	Transfer Case - MP 1625/1626 - [Link target (target-id 302593-) not found]
P17D4	Transfer Case - MP 3023/3024 - [Link target (target-id 302595-) not found]
P17D6	Automatic Transmission - 10L1000 - [Link target (target-id 315098-) not found]
P185F	Transfer Case - MP 1625/1626 - [Link target (target-id 302593-) not found]
P185F	Transfer Case - MP 3023/3024 - [Link target (target-id 302595-) not found]
P188B	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P188B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P1951	Power Take-Off - [Link target (target-id 359801-) not found]
P1952	Power Take-Off - [Link target (target-id 359801-) not found]
P1953	Power Take-Off - [Link target (target-id 359801-) not found]
P1954	Power Take-Off - [Link target (target-id 359801-) not found]
P1E00	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P1E00	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P2066	Displays and Gauges - [Link target (target-id 192567-) not found]
P2067	Displays and Gauges - [Link target (target-id 192567-) not found]
P2068	Displays and Gauges - [Link target (target-id 192567-) not found]
P2088	Engine Controls and Fuel - 6.6L - [Link target (target-id 294312-) not found]
P2089	Engine Controls and Fuel - 6.6L - [Link target (target-id 294312-) not found]
P2096	Engine Controls and Fuel - 6.6L - [Link target (target-id 228221-) not found]
P2097	Engine Controls and Fuel - 6.6L - [Link target (target-id 228221-) not found]
P2098	Engine Controls and Fuel - 6.6L - [Link target (target-id 228221-) not found]

DTC	Diagnostic Procedure
P2099	Engine Controls and Fuel - 6.6L - [Link target (target-id 228221-) not found]
P20CB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348402-) not found]
P20CD	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348402-) not found]
P20CE	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348402-) not found]
P20FF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320805-) not found]
P2101	Engine Controls and Fuel - 6.6L - [Link target (target-id 227727-) not found]
P2119	Engine Controls and Fuel - 6.6L - [Link target (target-id 227727-) not found]
P2122	Engine Controls and Fuel - 6.6L - [Link target (target-id 227773-) not found]
P2122	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186726-) not found]
P2123	Engine Controls and Fuel - 6.6L - [Link target (target-id 227773-) not found]
P2123	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186726-) not found]
P2127	Engine Controls and Fuel - 6.6L - [Link target (target-id 227773-) not found]
P2127	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186726-) not found]
P2128	Engine Controls and Fuel - 6.6L - [Link target (target-id 227773-) not found]
P2128	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186726-) not found]
P2135	Engine Controls and Fuel - 6.6L - [Link target (target-id 332809-) not found]
P2138	Engine Controls and Fuel - 6.6L - [Link target (target-id 227773-) not found]
P2138	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186726-) not found]
P2147	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2147	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P2148	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2148	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P2150	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2150	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P2151	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2151	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P2153	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2153	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P2154	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2154	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P2156	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2156	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P2157	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2157	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 317856-) not found]
P215B	Transfer Case - MP 1625/1626 - [Link target (target-id 302593-) not found]
P215B	Transfer Case - MP 3023/3024 - [Link target (target-id 302595-) not found]
P216B	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P216C	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P216E	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P216F	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2176	Engine Controls and Fuel - 6.6L - [Link target (target-id 227727-) not found]
P217B	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]

DTC	Diagnostic Procedure
P217C	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P217E	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P217F	Engine Controls and Fuel - 6.6L - [Link target (target-id 324174-) not found]
P2199	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 188060-) not found]
P219A	Engine Controls and Fuel - 6.6L - [Link target (target-id 227966-) not found]
P219B	Engine Controls and Fuel - 6.6L - [Link target (target-id 227966-) not found]
P2227	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P2228	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P2228	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P2229	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P2229	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P222A	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P222A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P222B	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P222B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P222C	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P222C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P222D	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P222D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P222E	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P222E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P222F	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P222F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P2230	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P2230	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283923-) not found]
P2264	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348344-) not found]
P2269	Engine Controls and Fuel - 6.6L - [Link target (target-id 333292-) not found]
P2269	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348344-) not found]
P2270	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P2271	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P2272	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P2273	Engine Controls and Fuel - 6.6L - [Link target (target-id 299054-) not found]
P227B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283924-) not found]
P227C	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P227C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283924-) not found]
P227D	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P227D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283924-) not found]
P227E	Engine Controls and Fuel - 6.6L - [Link target (target-id 333002-) not found]
P227E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 283924-) not found]
P228A	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]
P228B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]
P228C	Engine Controls and Fuel - 6.6L - [Link target (target-id 297085-) not found]

DTC	Diagnostic Procedure
P228C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]
P228D	Engine Controls and Fuel - 6.6L - [Link target (target-id 297085-) not found]
P228D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]
P2293	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]
P2294	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P2295	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P2296	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P2300	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2301	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2303	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2304	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2306	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2307	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2309	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2310	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2312	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2313	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2315	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2316	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2318	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2319	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2321	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P2322	Engine Controls and Fuel - 6.6L - [Link target (target-id 254362-) not found]
P233E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P233F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348346-) not found]
P24D6	Engine Controls and Fuel - 6.6L - [Link target (target-id 349584-) not found]
P24D7	Engine Controls and Fuel - 6.6L - [Link target (target-id 349584-) not found]
P24D8	Engine Controls and Fuel - 6.6L - [Link target (target-id 349584-) not found]
P250A	Displays and Gauges - [Link target (target-id 211596-) not found]
P251A	Power Take-Off - [Link target (target-id 265885-) not found]
P251E	Power Take-Off - [Link target (target-id 265886-) not found]
P251F	Power Take-Off - [Link target (target-id 265886-) not found]
P2534	Wiring Systems and Power Management - [Link target (target-id 221459-) not found]
P2535	Wiring Systems and Power Management - [Link target (target-id 221459-) not found]
P2544	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P2544	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P2561	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P2561	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P257D	Vehicle Access - [Link target (target-id 208940-) not found]
P257E	Vehicle Access - [Link target (target-id 208940-) not found]
P257F	Vehicle Access - [Link target (target-id 208940-) not found]
P258E	Power Take-Off - [Link target (target-id 265885-) not found]

DTC	Diagnostic Procedure
P2599	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 333291-) not found]
P25A2	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P25A2	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P25AF	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P25AF	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P25BD	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 257241-) not found]
P25C6	Hydraulic Brakes - [Link target (target-id 272270-) not found]
P25C7	Hydraulic Brakes - [Link target (target-id 272270-) not found]
P25C9	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P25C9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P260A	Power Take-Off - [Link target (target-id 164889-) not found]
P260B	Power Take-Off - [Link target (target-id 164889-) not found]
P260C	Power Take-Off - [Link target (target-id 164889-) not found]
P2610	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P2610	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P262B	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P262B	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P262B	Data Communications - [Link target (target-id 272300-) not found]
P2632	Engine Controls and Fuel - 6.6L - [Link target (target-id 228061-) not found]
P2632	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 203923-) not found]
P2633	Engine Controls and Fuel - 6.6L - [Link target (target-id 228061-) not found]
P2633	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 203923-) not found]
P2634	Engine Controls and Fuel - 6.6L - [Link target (target-id 228061-) not found]
P2634	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 203923-) not found]
P264F	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P264F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P2670	Automatic Transmission - 10L1000 - [Link target (target-id 315243-) not found]
P2671	Automatic Transmission - 10L1000 - [Link target (target-id 315243-) not found]
P2687	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278998-) not found]
P2688	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278998-) not found]
P2689	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 278998-) not found]
P268C	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186747-) not found]
P268D	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186747-) not found]
P268E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186747-) not found]
P268F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186747-) not found]
P2690	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186747-) not found]
P2691	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186747-) not found]
P2692	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186747-) not found]
P2693	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 186747-) not found]
P26C8	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]
P26C8	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P26C9	Engine Controls and Fuel - 6.6L - [Link target (target-id 276019-) not found]

DTC	Diagnostic Procedure
P26C9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 306778-) not found]
P26FA	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349325-) not found]
P2714	Automatic Transmission - 10L1000 - [Link target (target-id 315042-) not found]
P2715	Automatic Transmission - 10L1000 - [Link target (target-id 315042-) not found]
P2718	Automatic Transmission - 10L1000 - [Link target (target-id 315011-) not found]
P2720	Automatic Transmission - 10L1000 - [Link target (target-id 315011-) not found]
P2721	Automatic Transmission - 10L1000 - [Link target (target-id 315011-) not found]
P2723	Automatic Transmission - 10L1000 - [Link target (target-id 315233-) not found]
P2724	Automatic Transmission - 10L1000 - [Link target (target-id 315233-) not found]
P2727	Automatic Transmission - 10L1000 - [Link target (target-id 315075-) not found]
P2729	Automatic Transmission - 10L1000 - [Link target (target-id 315075-) not found]
P2730	Automatic Transmission - 10L1000 - [Link target (target-id 315075-) not found]
P2732	Automatic Transmission - 10L1000 - [Link target (target-id 315065-) not found]
P2733	Automatic Transmission - 10L1000 - [Link target (target-id 315065-) not found]
P2736	Automatic Transmission - 10L1000 - [Link target (target-id 315066-) not found]
P2738	Automatic Transmission - 10L1000 - [Link target (target-id 315066-) not found]
P2739	Automatic Transmission - 10L1000 - [Link target (target-id 315066-) not found]
P279A	Transfer Case - MP 1625/1626 - [Link target (target-id 302593-) not found]
P279A	Transfer Case - MP 3023/3024 - [Link target (target-id 302595-) not found]
P279B	Transfer Case - MP 1625/1626 - [Link target (target-id 302593-) not found]
P279B	Transfer Case - MP 3023/3024 - [Link target (target-id 302595-) not found]
P279C	Transfer Case - MP 1625/1626 - [Link target (target-id 302593-) not found]
P279C	Transfer Case - MP 3023/3024 - [Link target (target-id 302595-) not found]
P27A7	Automatic Transmission - 10L1000 - [Link target (target-id 315008-) not found]
P27A8	Automatic Transmission - 10L1000 - [Link target (target-id 315008-) not found]
P27A9	Automatic Transmission - 10L1000 - [Link target (target-id 315008-) not found]
P27AA	Automatic Transmission - 10L1000 - [Link target (target-id 315008-) not found]
P27AB	Automatic Transmission - 10L1000 - [Link target (target-id 315008-) not found]
P27AC	Automatic Transmission - 10L1000 - [Link target (target-id 315008-) not found]
P27AD	Automatic Transmission - 10L1000 - [Link target (target-id 315008-) not found]
P27AE	Automatic Transmission - 10L1000 - [Link target (target-id 315008-) not found]
P27B5	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P27B5	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P2802	Automatic Transmission - 10L1000 - [Link target (target-id 315244-) not found]
P2803	Automatic Transmission - 10L1000 - [Link target (target-id 315244-) not found]
P2805	Automatic Transmission - 10L1000 - [Link target (target-id 315244-) not found]
P2812	Automatic Transmission - 10L1000 - [Link target (target-id 315067-) not found]
P2814	Automatic Transmission - 10L1000 - [Link target (target-id 315067-) not found]
P2815	Automatic Transmission - 10L1000 - [Link target (target-id 315067-) not found]
P2817	Automatic Transmission - 10L1000 - [Link target (target-id 315229-) not found]
P2818	Automatic Transmission - 10L1000 - [Link target (target-id 315229-) not found]
P281B	Automatic Transmission - 10L1000 - [Link target (target-id 315235-) not found]

DTC	Diagnostic Procedure
P281D	Automatic Transmission - 10L1000 - [Link target (target-id 315235-) not found]
P281E	Automatic Transmission - 10L1000 - [Link target (target-id 315235-) not found]
P2820	Automatic Transmission - 10L1000 - [Link target (target-id 314990-) not found]
P2824	Automatic Transmission - 10L1000 - [Link target (target-id 319380-) not found]
P2826	Automatic Transmission - 10L1000 - [Link target (target-id 319380-) not found]
P2827	Automatic Transmission - 10L1000 - [Link target (target-id 319380-) not found]
P2957	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349316-) not found]
P2958	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 333291-) not found]
P2B08	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2B09	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2B0A	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2B0B	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2B0C	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2B0D	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2B0E	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2B0F	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2B95	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P2BA0	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349325-) not found]
P2C1E	Engine Controls and Fuel - 6.6L - [Link target (target-id 297085-) not found]
P2C1F	Engine Controls and Fuel - 6.6L - [Link target (target-id 297085-) not found]
P2C1F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]
P2C20	Engine Controls and Fuel - 6.6L - [Link target (target-id 297085-) not found]
P2C20	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348339-) not found]
P2C48	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349325-) not found]
P30D4	Engine Controls and Fuel - 6.6L - [Link target (target-id 348558-) not found]
P30D6	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P30D6	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P30D6	Data Communications - [Link target (target-id 272300-) not found]
P30D7	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P30D7	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P30D7	Data Communications - [Link target (target-id 272300-) not found]
P30D8	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P30D8	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P30D8	Data Communications - [Link target (target-id 272300-) not found]
P30D9	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P30D9	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P30D9	Data Communications - [Link target (target-id 272300-) not found]
P30DA	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P30DA	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P30DA	Data Communications - [Link target (target-id 272300-) not found]
P30DB	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P30DB	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]

DTC	Diagnostic Procedure
P30DB	Data Communications - [Link target (target-id 272300-) not found]
P30DC	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P30DC	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P30DC	Data Communications - [Link target (target-id 272300-) not found]
P30DD	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P30DD	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P30DD	Data Communications - [Link target (target-id 272300-) not found]
P30DE	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P30DE	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P314E	Engine Controls and Fuel - 6.6L - [Link target (target-id 316955-) not found]
P314E	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348714-) not found]
P3186	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P3186	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P3186	Data Communications - [Link target (target-id 272300-) not found]
P3187	Engine Controls and Fuel - 6.6L - [Link target (target-id 327505-) not found]
P3187	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348345-) not found]
P3188	Engine Controls and Fuel - 6.6L - [Link target (target-id 327505-) not found]
P3188	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 348345-) not found]
P3191	Engine Controls and Fuel - 6.6L - [Link target (target-id 324290-) not found]
P3191	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 324077-) not found]
P3196	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349325-) not found]
P3198	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349325-) not found]
P3199	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349325-) not found]
P31ED	Power Take-Off - [Link target (target-id 359802-) not found]
P3261	Engine Controls and Fuel - 6.6L - [Link target (target-id 321208-) not found]
P3261	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320536-) not found]
P3262	Engine Controls and Fuel - 6.6L - [Link target (target-id 321208-) not found]
P3262	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320536-) not found]
P3263	Engine Controls and Fuel - 6.6L - [Link target (target-id 321208-) not found]
P3263	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 320536-) not found]
U0073	Data Communications - [Link target (target-id 148027-) not found]
U0074	Data Communications - [Link target (target-id 168614-) not found]
U0075	Data Communications - [Link target (target-id 219671-) not found]
U0076	Data Communications - [Link target (target-id 225597-) not found]
U0077	Data Communications - [Link target (target-id 206829-) not found]
U0079	Data Communications - [Link target (target-id 313798-) not found]
U007B	Data Communications - [Link target (target-id 274046-) not found]
U007E	Data Communications - [Link target (target-id 277590-) not found]
U00C0	Data Communications - [Link target (target-id 353509-) not found]
U0100-U02FF	Data Communications - [Link target (target-id 148031-) not found]
U010C	Data Communications - [Link target (target-id 354860-) not found]
U0212	Data Communications - [Link target (target-id 329087-) not found]

DTC	Diagnostic Procedure
U029D	Data Communications - [Link target (target-id 329021-) not found]
U029E	Data Communications - [Link target (target-id 329022-) not found]
U02A3	Data Communications - [Link target (target-id 329024-) not found]
U03C1	Engine Controls and Fuel - 6.6L - [Link target (target-id 362305-) not found]
U03C1	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 355448-) not found]
U0400-U05FF	Data Communications - [Link target (target-id 179843-) not found]
U0600-U06FF	Data Communications - [Link target (target-id 276055-) not found]
U0606	Engine Controls and Fuel - 6.6L - [Link target (target-id 332809-) not found]
U0607	Engine Controls and Fuel - 6.6L - [Link target (target-id 332809-) not found]
U060F	Engine Controls and Fuel - 6.6L - [Link target (target-id 362305-) not found]
U060F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 355448-) not found]
U0625	Engine Controls and Fuel - 6.6L - [Link target (target-id 316948-) not found]
U062F	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349325-) not found]
U0654	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 319639-) not found]
U1002	Data Communications - [Link target (target-id 265917-) not found]
U1004	Data Communications - [Link target (target-id 317042-) not found]
U1005	Data Communications - [Link target (target-id 317043-) not found]
U1006	Data Communications - [Link target (target-id 317044-) not found]
U1008	Data Communications - [Link target (target-id 317046-) not found]
U1009	Data Communications - [Link target (target-id 317047-) not found]
U1014	Data Communications - [Link target (target-id 349501-) not found]
U101A	Data Communications - [Link target (target-id 317051-) not found]
U101B	Engine Controls and Fuel - 6.6L - [Link target (target-id 316948-) not found]
U1109	Data Communications - [Link target (target-id 329043-) not found]
U110A	Data Communications - [Link target (target-id 329044-) not found]
U111B	Data Communications - [Link target (target-id 329051-) not found]
U1121	Lighting - [Link target (target-id 366194-) not found]
U1121	Data Communications - [Link target (target-id 329054-) not found]
U1122	Data Communications - [Link target (target-id 329055-) not found]
U112D	Data Communications - [Link target (target-id 329059-) not found]
U1133	Data Communications - [Link target (target-id 329064-) not found]
U113B	Data Communications - [Link target (target-id 329070-) not found]
U1145	Data Communications - [Link target (target-id 329073-) not found]
U1146	Data Communications - [Link target (target-id 329074-) not found]
U118A	Data Communications - [Link target (target-id 335269-) not found]
U11FD	Data Communications - [Link target (target-id 349284-) not found]
U1300-U1344	Data Communications - [Link target (target-id 317053-) not found]
U1345-U1349	Data Communications - [Link target (target-id 317756-) not found]
U134A-U14FF	Data Communications - [Link target (target-id 317053-) not found]
U1378	Engine Controls and Fuel - 6.6L Diesel - [Link target (target-id 349325-) not found]
U1500-U15FF	Data Communications - [Link target (target-id 179844-) not found]
U1602	Data Communications - [Link target (target-id 328899-) not found]

DTC	Diagnostic Procedure
U1603	Data Communications - [Link target (target-id 328900-) not found]
U1604	Data Communications - [Link target (target-id 317757-) not found]
U1605	Data Communications - [Link target (target-id 317758-) not found]
U1607	Data Communications - [Link target (target-id 328512-) not found]
U1608	Data Communications - [Link target (target-id 328513-) not found]
U1609	Data Communications - [Link target (target-id 328514-) not found]
U160B	Data Communications - [Link target (target-id 328516-) not found]
U160C	Data Communications - [Link target (target-id 328517-) not found]
U160F	Data Communications - [Link target (target-id 328518-) not found]
U1610	Data Communications - [Link target (target-id 328519-) not found]
U1611	Data Communications - [Link target (target-id 319395-) not found]
U1643	Data Communications - [Link target (target-id 332932-) not found]
U164A	Data Communications - [Link target (target-id 332934-) not found]
U164B	Data Communications - [Link target (target-id 335271-) not found]
U164E	Data Communications - [Link target (target-id 332935-) not found]
U164F	Data Communications - [Link target (target-id 332936-) not found]
U1650	Data Communications - [Link target (target-id 184700-) not found]
U1651	Data Communications - [Link target (target-id 184702-) not found]
U166A	Data Communications - [Link target (target-id 332946-) not found]
U1818	Data Communications - [Link target (target-id 168622-) not found]
U18A2	Data Communications - [Link target (target-id 225598-) not found]
U18D5	Data Communications - [Link target (target-id 301775-) not found]
U18D7	Data Communications - [Link target (target-id 301776-) not found]
U18DC	Data Communications - [Link target (target-id 302552-) not found]
U1960-U1962	Data Communications - [Link target (target-id 315363-) not found]
U1961	Image Display Cameras - [Link target (target-id 364463-) not found]
U1967	Cellular, Entertainment, and Navigation - [Link target (target-id 319002-) not found]
U1973	Displays and Gauges - [Link target (target-id 309457-) not found]
U1977	Data Communications - [Link target (target-id 317061-) not found]
U1978	Data Communications - [Link target (target-id 317062-) not found]
U197B	Data Communications - [Link target (target-id 317065-) not found]
U197C	Data Communications - [Link target (target-id 317066-) not found]
U197D	Data Communications - [Link target (target-id 317067-) not found]
U197E	Displays and Gauges - [Link target (target-id 317153-) not found]
U197F	Displays and Gauges - [Link target (target-id 317154-) not found]
U1982-U1984	Data Communications - [Link target (target-id 320510-) not found]
U198B	Data Communications - [Link target (target-id 349296-) not found]
U2000-U20FF	Data Communications - [Link target (target-id 317070-) not found]
U2110-U2117	Data Communications - [Link target (target-id 317071-) not found]
U216A	Data Communications - [Link target (target-id 297676-) not found]
U2203	Data Communications - [Link target (target-id 328595-) not found]
U2204	Data Communications - [Link target (target-id 328622-) not found]

DTC	Diagnostic Procedure
U2205	Data Communications - [Link target (target-id 328623-) not found]
U2209	Data Communications - [Link target (target-id 328624-) not found]
U220C	Data Communications - [Link target (target-id 328626-) not found]
U220E	Data Communications - [Link target (target-id 328628-) not found]
U220F	Data Communications - [Link target (target-id 328629-) not found]
U2211	Data Communications - [Link target (target-id 328630-) not found]
U2212	Data Communications - [Link target (target-id 328631-) not found]
U2213	Data Communications - [Link target (target-id 328632-) not found]
U221E	Data Communications - [Link target (target-id 349505-) not found]
U2413	Data Communications - [Link target (target-id 301778-) not found]
U2418	Data Communications - [Link target (target-id 328636-) not found]
U2419	Data Communications - [Link target (target-id 328637-) not found]
U241C	Data Communications - [Link target (target-id 328638-) not found]
U241D	Data Communications - [Link target (target-id 328639-) not found]
U2A90	Displays and Gauges - [Link target (target-id 322010-) not found]
U2A91	Displays and Gauges - [Link target (target-id 322011-) not found]
U2AE6-U2AE9	Power Take-Off - [Link target (target-id 359804-) not found]
U2C91	Data Communications - [Link target (target-id 349297-) not found]
U3000	Displays and Gauges - [Link target (target-id 324190-) not found]
U3000	Image Display Cameras - [Link target (target-id 327503-) not found]
U3000	Data Communications - [Link target (target-id 229188-) not found]
U3000	Driver Assistance Systems - [Link target (target-id 317614-) not found]
U3000	Parking Assistance Systems - [Link target (target-id 320659-) not found]
U3000	Power Seats - [Link target (target-id 352062-) not found]
U3000	Power Steering - [Link target (target-id 317740-) not found]
U3002	Antilock Brake System - [Link target (target-id 309495-) not found]
U3002	Data Communications - [Link target (target-id 280674-) not found]
U3002	Driver Assistance Systems - [Link target (target-id 329016-) not found]
U3003	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 205272-) not found]
U3006-U3009	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 311937-) not found]
U300D	Wiring Systems and Power Management - [Link target (target-id 319488-) not found]
U3012	Data Communications - [Link target (target-id 266129-) not found]
U3018	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 297157-) not found]
U3019	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 297157-) not found]
U301A-U301C	Data Communications - [Link target (target-id 349521-) not found]
U3023	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 327359-) not found]
U3034	Data Communications - [Link target (target-id 315363-) not found]
U3035	Data Communications - [Link target (target-id 315363-) not found]
U3501-U3588	Starting, Charging, and Low Voltage Energy Storage - [Link target (target-id 297157-) not found]
U35B9	Data Communications - [Link target (target-id 332964-) not found]

Symptom Byte List

Symptom Byte List

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
00	No Sub Type Information	This sub type is used for failures where the base DTC text string provides the complete description of the failure itself.
01	General Electrical Failure	This sub type is used for General Electrical Failures that cannot be assigned to a specific sub type.
02	General Signal Failure	This sub type is used for General Signal Failures that cannot be assigned to a specific sub type.
03	FM (Frequency Modulated) / PWM (Pulse Width Modulated) Failure	This sub type is used for FM / PWM Failures that cannot be assigned to a specific sub type.
04	System Internal Failure	This sub type is used for control module Internal Failures that cannot be assigned to a specific sub type.
05	System Programming Failure	This sub type is used for System Programming Failures that cannot be assigned to a specific sub type.
06	Algorithm Based Failure	This sub type is used for Algorithm Based Failures that cannot be assigned to a specific sub type.
07	Mechanical Failure	This sub type is used for Mechanical Failures that cannot be assigned to a specific sub type.
08	Bus Signal / Message Failure	This sub type is used for Bus Signal / Message Failures that cannot be assigned to a specific sub type.
09	Component Failure	This sub type is used for Component Failures that cannot be assigned to a specific sub type.
0A	General Electric Failures — 2	This range specifies the standard wiring failure modes (i.e., shorts and opens), and direct current (DC) quantities related by Ohm's Law.
0B	Reserved	—
0C	Reserved	—
0D	Reserved	—
0E	Reserved	—
0F	Reserved	—
10	Reserved	—
11	Circuit Short To Ground	This sub type is used for failures where the control module measures ground (battery negative) potential for greater than a specified time period or when some other value less than the low voltage limit DTC Sub Type is measured.
12	Circuit Short To Battery	This sub type is used for failures, where the control module measures vehicle system (battery positive) potential for greater than a specified time period or when some other value higher than the high voltage limit DTC Sub Type is measured.
13	Circuit Open	This sub type is used for failures, where the control module determines an open circuit via lack of bias voltage, low current flow, no change in the state of an input in response to an output, etc.
14	Circuit Short To Ground or Open	This sub type is used for failures, where the condition detected by the control module is the same for either indicated failure mode.
15	Circuit Short To Battery or Open	This sub type is used for failures, where the condition detected by the control module is the same for either indicated failure mode.
16	Circuit Voltage Below Threshold	This sub type is used for failures, where the control module measures a voltage below a specified range.
17	Circuit Voltage Above Threshold	This sub type is used for failures, where the control module measures a voltage above a specified range.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
18	Circuit Current Below Threshold	This sub type is used for failures, where the control module measures current flow below a specified range.
19	Circuit Current Above Threshold	This sub type is used for failures, where the control module measures current flow above a specified range.
1A	Circuit Resistance Below Threshold	This sub type is used for failures, where the control module infers a circuit resistance below a specified range.
1B	Circuit Resistance Above Threshold	This sub type is used for failures, where the control module infers a circuit resistance above a specified range.
1C	Circuit Voltage Out of Range	This sub type is used for failures, where the control module measures a voltage outside the expected range but not identified as too high or too low.
1D	Circuit Current Out of Range	This sub type is used for failures, where the control module measures a current outside the expected range but not identified as too high or too low.
1E	Circuit Resistance Out of Range	This sub type is used for failures, where the control module measures a resistance outside the expected range but not identified as too high or too low.
1F	Circuit Intermittent	This sub type is used for failures, where the control module momentarily detects one of the conditions defined above, but not long enough to set a specific sub type.
20	Reserved	—
21	Signal Amplitude < Minimum	This sub type is used for failures where the control module measures a signal voltage amplitude below a specified range (e.g., low gain).
22	Signal Amplitude > Maximum	This sub type is used for failures where the control module measures a signal voltage amplitude above a specified range (e.g., gain too high).
23	Signal Stuck Low	This sub type is used for failures where the control module measures a signal that remains low when transitions are expected.
24	Signal Stuck High	This sub type is used for failures where the control module measures a signal that remains high when transitions are expected.
25	Signal Shape / Waveform Failure	This sub type is used for failures where the shape of the signal (plot of the amplitude with respect to time) is not correct, e.g., improper circuit impedance.
26	Signal Rate of Change Below Threshold	This sub type is used for failures where the signal transitions more slowly than the specified limit.
27	Signal Rate of Change Above Threshold	This sub type is used for failures where the signal transitions more quickly than the specified limit.
28	Signal Bias Level Out of Range / Zero Adjustment Failure	This sub type is used for failures where the control module applies a bias voltage or a zero signal level to a circuit upon which is superimposed a signal voltage (e.g., bias voltage to an Oxygen Sensor circuit, or a filtered digital m/sec2 signal while vehicle stands still for a lateral accelerator sensor module.)
29	Signal Invalid	This sub type is used for failures where the value of the signal is not plausible given the operating conditions.
2A	Signal Stuck In Range	This sub type is used for failures where the value of the signal is in the normal operating range, but not correct for current operating conditions.
2B	Signal Cross Coupled	This sub type is used when a signal is found to be incorrectly correlated to another signal that the control module is also monitoring, indicating that the signals are shorted together
2C	Reserved	—
2D	Reserved	—
2E	Reserved	—

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
2F	Signal Erratic	This sub type is used for failures where the signal is momentarily implausible (not long enough for "signal invalid") or discontinuous.
30	Reserved	—
31	No Signal	This sub type is used for failures where the control module does not detect a signal which ought to be present (e.g., wheel speed signals present for three of the four wheels and brakes not applied.)
32	Signal Low Time < Minimum	This sub type is used for failures where the control module detects the low pulse is too narrow with respect to time.
33	Signal Low Time > Maximum	This sub type is used for failures where the control module detects the low pulse is too wide with respect to time.
34	Signal High Time < Minimum	This sub type is used for failures where the control module detects the high pulse is too narrow with respect to time.
35	Signal High Time > Maximum	This sub type is used for failures where the control module detects the high pulse is too wide with respect to time.
36	Signal Frequency Too Low	This sub type is used for failures where the control module detects excessive duration for one cycle of the output across a specified sample size.
37	Signal Frequency Too High	This sub type is used for failures where the control module detects insufficient duration for one cycle of the output across a specified sample size.
38	Signal Frequency Incorrect	This sub type is used for failures where the control module measures an incorrect number of cycles in a given time period.
39	Signal Has Too Few Pulses	This sub type is used for failures where the control module measures too few pulses (e.g., position is calibrated in counts from one extreme to the other).
3A	Signal Has Too Many Pulses	This sub type is used for failures where the control module measures too many pulses (e.g., position is calibrated in counts from one extreme to the other).
3B	Reserved	—
3C	Reserved	—
3D	Reserved	—
3E	Reserved	—
3F	Reserved	—
40	Reserved	—
41	General Checksum Failure	This sub type is used by the control module to indicate an incorrect checksum calculation where memory type is not specified.
42	General Memory Failure	This sub type is used by the control module to indicate a memory failure where memory type is not specified.
43	Special Memory Failure	This sub type is used by the control module to indicate a memory failure where the specific memory type is not defined in this category.
44	Data Memory Failure	This sub type is used by the control module to indicate a data (or working) memory failure for embedded systems using FLASH memory. This is equivalent to RAM in RAM/ROM/EEPROM embedded systems.
45	Program Memory Failure	This sub type is used by the control module to indicate a program memory failure for embedded systems using FLASH memory. This is equivalent to ROM in RAM/ROM/EEPROM embedded systems.
46	Calibration / Parameter Memory Failure	This sub type is used by the control module to indicate a calibration / parameter memory failure for embedded systems using FLASH memory. This is equivalent to EEPROM in RAM/ROM/EEPROM embedded systems.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
47	Watchdog / Safety µC Failure	This sub type is used by the control module to indicate a watchdog / safety µC failure, or a failure in the execution of operational software.
48	Supervision Software Failure	This sub type is used by the control module to indicate a supervision software failure.
49	Internal Electronic Failure	This sub type is used by the control module to indicate the detection of an internal circuit failure.
4A	Incorrect Component Installed	This sub type is used by the control module to indicate a mismatch between the hardware connected to the control module and the hardware expected by the control module.
4B	Over Temperature	This sub type is used by the control module to indicate the detection of an internal temperature above the expected range.
4C	Reserved	—
4D	Reserved	—
4E	Reserved	—
4F	Reserved	—
50	Reserved	—
51	Not Programmed	This sub type is used by the control module to indicate that programming is required.
52	Not Activated	This sub type is used by the control module to indicate that some portion of the program has not been enabled.
53	Deactivated	This sub type is used by the control module to indicate that that some portion of the program has been disabled.
54	Missing Setup/Learn	This sub type is used by the control module to indicate that an operational range, etc., for a sensor or actuator must be taught to the control module, e.g. by programming or learning.
55	Not Configured	This sub type is used by the control module to indicate the need to enter (program) the sub system option content or the vehicle option content.
56	Invalid / Incompatible Configuration	This sub type indicates a control module or system configuration that cannot be valid, e.g. to have mutually exclusive options set on at the same time, or a set up that is not supported by the currently installed hardware/software.
57	Invalid / Incompatible Software Component	This sub type is used by the control module to indicate that a software component (calibration or program) has been identified as invalid for the control module or incompatible with other hardware or software identified by the control module, e.g. a downloaded calibration software component is incompatible with a permanent or downloaded strategy software component.
58	Reserved	—
59	Reserved	—
5A	Reserved	—
5B	Reserved	—
5C	Reserved	—
5D	Reserved	—
5E	Reserved	—
5F	Reserved	—
60	Reserved	—
61	Signal Calculation Failure	This sub type is used for algorithm based calculation failures where the calculated value is outside the expected range.
62	Signal Compare Failure	This sub type is used for failures where the control module compares two or more input parameters for plausibility but cannot specifically identify the component that is faulted.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
63	Circuit / Component Protection Time-Out	This sub type is used for failures where the control module detects a function is active for greater than a specified time period.
64	Signal Plausibility Failure	This sub type is used for failures where the control module detects a single input parameter is operating outside the plausible range.
65	Signal Has Too Few Transitions / Events	This sub type is used for failures where the control module monitors a parameter over time within specified limits and detects fewer than the expected number of transitions.
66	Signal Has Too Many Transitions / Events	This sub type is used for failures where the control module monitors a parameter over time within specified limits and detects more than the expected number of transitions.
67	Signal Incorrect After Event	This sub type is used for failures where the control module does not see the correct change of a parameter or group of parameters in response to a particular event.
68	Event Information	This sub type is used by the control module to indicate the detection of a system event that was not caused by the control module itself but forces the control module to store a DTC (e.g. missing functionality from another system/control module).
69	Reserved	—
6A	Reserved	—
6B	Reserved	—
6C	Reserved	—
6D	Reserved	—
6E	Reserved	—
6F	Reserved	—
70	Reserved	—
71	Actuator Stuck	This sub type is used for failures where the control module does not detect any mechanical motion in response to energizing a motor, solenoid, relay, etc.
72	Actuator Stuck Open	This sub type is used for failures where the control module does not detect any mechanical motion upon commanding the operation of a motor, solenoid, relay, etc., to close some piece of equipment.
73	Actuator Stuck Closed	This sub type is used for failures where the control module does not detect any mechanical motion upon commanding the operation of a motor, solenoid, relay, etc., to open some piece of equipment.
74	Actuator Slipping	This sub type is used for failures where the control module detects excessive duration to command a motor, solenoid, relay, etc., to move a piece of equipment to a desired position.
75	Emergency Position Not Reachable	This sub type is used for failures where the control module is unable to command a motor, solenoid, relay, etc., to move a piece of equipment to the emergency position.
76	Wrong Mounting Position	This sub type is used for failures where the control module detects incorrectly mounted components, e.g., acceleration sensor showing a position error of 90°.
77	Commanded Position Not Reachable	This sub type is used for failures where the control module is unable to command a motor, solenoid, relay, etc., to move a piece of equipment to the commanded position either due to a failure in the actuator or its mechanical environment.
78	Alignment or Adjustment Incorrect	This sub type is used for failures where the control module detects incorrectly adjusted or aligned components.
79	Mechanical Linkage Failure	This sub type is used for failures where the control module detects that the actuator is operational but the driven device is not operating, e.g., drive cable for power sliding door broken.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
7A	Fluid Leak or Seal Failure	This sub type is used for failures where the control module detects that a mechanical component has an unexpected gas or liquid flow in, out, or through the component.
7B	Low Fluid Level	This sub type is used for failures where the control module detects that a fluid level is too low for proper operation of the system.
7C	Slow Response	This sub type is used where control module has detected a response that is longer than expected or a degraded rate of change in the monitored component or system.
7D	Reserved	—
7E	Actuator Stuck On	This sub type is used for failures where the control module detects the actuator mechanical function is fixed in the ON / applied state
7F	Actuator Stuck Off	This sub type is used for failures where the control module detects the actuator mechanical function is fixed in the OFF / Released state.
80	Reserved	—
81	Invalid Serial Data Received	This sub type is used by the control module to indicate a signal was received with the corresponding validity bit equal to "invalid" or post processing of the signal determines it is invalid.
82	Alive / Sequence Counter Incorrect / Not Updated	This sub type is used by the control module to indicate that a signal was received without the corresponding rolling count value being properly updated.
83	Value of Signal Protection Calculation Incorrect	This sub type is used by the control module to indicate, that a message was processed with an incorrect protection (checksum) calculation.
84	Signal Below Allowable Range	This sub type is used for failures where some circuit quantity, reported via serial data, is below a specified range.
85	Signal Above Allowable Range	This sub type is used for failures where some circuit quantity, reported via serial data, is above a specified range.
86	Signal Invalid	This sub type is used for failures where some circuit quantity, reported via serial data, is not plausible given the operating conditions.
87	Missing Message	This sub type is used for failures where one (or more) expected message(s) is not received, e.g., periodic transmission where the repetition time is too high, or message not received as a result of unforeseen reset events of the concerning component (e.g. engine control unit communicating with ABS).
88	Bus off	This sub type is used for failures where a data bus is not available.
89	Data Transfer Failure	This subtype is for failures where an ECU requests a data transfer from an external source (off-board, on-board, or another ECU) and the data transfer initiates but fails to complete.
8A	Reserved	—
8B	Reserved	—
8C	Reserved	—
8D	Reserved	—
8E	Reserved	—
8F	Erratic	This sub type is used for failures where the signal, reported via serial data, is momentarily implausible or discontinuous.
90	Reserved	—
91	Parametric	This sub type is used for failures where the control module has detected that a component parameter (e.g., capacitance or inductance) is outside its expected range.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
92	Performance or Incorrect Operation	This sub type is used for failures where the control module has detected that the component performance is outside its expected range or operating in an incorrect way.
93	No Operation	This sub type is used for failures where the control module has detected that the component is not operating.
94	Unexpected Operation	This sub type is used for failures where the control module has detected that the component is operating in a way or at a time that it has not been commanded to operate.
95	Incorrect Assembly	This sub type is used for failures where the control module has detected that the component has been incorrectly installed (e.g., hydraulic pipes crossed over, circuits cross wired) or polarity errors.
96	Component Internal Failure	This sub type is used for failures where the control module has received an indication about the component that indicates a failure (e.g., an intelligent actuator or sensor) is indicating an internal fault.
97	Component or System Operation Obstructed or Blocked	This sub type is used for failures where the control module has detected that the operation of a component is prevented by an obstruction, e.g., advanced cruise system radar beam obstructed.
98	Component or System Over Temperature	This sub type is used for failures where the control module has detected that the temperature is too high for the correct operation of the component or system.
99	Exceeded Learning Limit	This sub type is used for failures where the control module has detected that the component or system has exceeded the expected range allowed for learning component tolerances.
9A	Component or System Operating Conditions	This sub type is used for failures where the control module has detected that environmental or other operating conditions are either temporarily or permanently outside the design limits for correct operation such that all or part of a component function is inhibited or fails, e.g. a radio is disabled because its LCD display or its CD mechanism cannot operate at a low ambient temperature.
9B	High/Excessive Flow	This sub type is used for failures where the control module has detected that the component or system is operating above the expected flow range flow, e.g. too much EGR at idle.
9C	Low/Insufficient Flow	This sub type is used for failures where the control module has detected that the component or system is operating below the expected flow range flow, e.g. too little EGR at part throttle.
9D	Component or System Under Temperature	This sub type is used for failures where the control module has detected that the temperature is too low for the correct operation of the component or system.
9E	Stuck On	This sub type is used for failures where the control module detects the electrical circuit or switch is fixed in the ON / Applied state
9F	Stuck Off	This sub type is used for failures where the control module detects the electrical circuit or switch is fixed in the OFF / Released state.
A0	Reserved	—
A1	System Voltage	This sub type is used for failures, where the control module system voltage is outside the expected range but not identified as too high or too low.
A2	System Voltage Low	This sub type is used for failures where the control module system voltage is below a specified range.
A3	System Voltage High	This sub type is used for failures where the control module system voltage is above a specified range.
A4	Reserved	—
A5	Reserved	—

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
A6	Reserved	—
A7	Reserved	—
A8	Reserved	—
A9	Reserved	—
AA	Reserved	—
AB	Reserved	—
AC	Reserved	—
AD	Reserved	—
AE	Reserved	—
AF	Reserved	—
B0	Reserved	—
B1	Reserved	—
B2	Reserved	—
B3	Reserved	—
B4	Reserved	—
B5	Reserved	—
B6	Reserved	—
B7	Reserved	—
B8	Reserved	—
B9	Reserved	—
BA	Reserved	—
BB	Reserved	—
BC	Reserved	—
BD	Reserved	—
BE	Reserved	—
BF	Reserved	—
C0	Reserved	—
C1	Reserved	—
C2	Reserved	—
C3	Reserved	—
C4	Reserved	—
C5	Reserved	—
C6	Reserved	—
C7	Reserved	—
C8	Reserved	—
C9	Reserved	—
CA	Reserved	—
CB	Reserved	—
CC	Reserved	—
CD	Reserved	—
CE	Reserved	—
CF	Reserved	—

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
D0	Reserved	—
D1	Reserved	—
D2	Reserved	—
D3	Reserved	—
D4	Reserved	—
D5	Reserved	—
D6	Reserved	—
D7	Reserved	—
D8	Reserved	—
D9	Reserved	—
DA	Reserved	—
DB	Reserved	—
DC	Reserved	—
DD	Reserved	—
DE	Reserved	—
DF	Reserved	—
E0	Reserved	—
E1	Reserved	—
E2	Reserved	—
E3	Reserved	—
E4	Reserved	—
E5	Reserved	—
E6	Reserved	—
E7	Reserved	—
E8	Reserved	—
E9	Reserved	—
EA	Reserved	—
EB	Reserved	—
EC	Reserved	—
ED	Reserved	—
EE	Reserved	—
EF	Reserved	—
F0	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
F1	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
F2	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
F3	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
F4	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
F5	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.

Symptom Byte	Symptom Byte Description	Symptom Byte Definition
F6	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
F7	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
F8	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
F9	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
FA	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
FB	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
FC	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
FD	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
FE	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.
FF	Manufacturer Defined	This value is reserved for vehicle manufacturer/system supplier use.

Symptoms - Vehicle

Body Repair

- [Link target (target-id 266613-) not found]
- [Link target (target-id 263864-) not found]

Body Systems

- [Link target (target-id 157990-) not found]
- [Link target (target-id 48522-) not found]
- [Link target (target-id 157988-) not found]
- [Link target (target-id 157992-) not found]
- [Link target (target-id 157994-) not found]
- [Link target (target-id 61936-) not found]

Brakes

- [Link target (target-id 1496-) not found]
- [Link target (target-id 302729-) not found]
- [Link target (target-id 50306-) not found]
- [Link target (target-id 54639-) not found]

Driveline/Axle

- [Link target (target-id 64694-) not found]
- [Link target (target-id 64690-) not found]
- [Link target (target-id 150354-) not found]
- [Link target (target-id 64697-) not found]

Driver Information and Entertainment

- [Link target (target-id 149620-) not found]
- [Link target (target-id 47032-) not found]
- [Link target (target-id 158155-) not found]
- [Link target (target-id 284269-) not found]
- [Link target (target-id 158091-) not found]

Engine

- [Link target (target-id 10846-) not found]
- [Link target (target-id 227894-) not found] – 6.6L (L8T) engine
- [Link target (target-id 186748-) not found] – 6.6L (L5P) Diesel engine
- [Link target (target-id 37429-) not found]
- [Link target (target-id 226061-) not found] – 6.6L (L8T) engine
- [Link target (target-id 203627-) not found] – 6.6L (L5P) Diesel engine
- [Link target (target-id 37994-) not found]
- [Link target (target-id 37791-) not found]

General Information

[Link target (target-id 62604-) not found]

HVAC

- [Link target (target-id 169242-) not found]
- [Link target (target-id 49126-) not found]
- [Link target (target-id 49993-) not found]

Power and Signal Distribution

- [Link target (target-id 159675-) not found]
- [Link target (target-id 259572-) not found]
- [Link target (target-id 121150-) not found]
- [Link target (target-id 62211-) not found]

Roof

[Link target (target-id 56634-) not found]

Safety and Security

- [Link target (target-id 284270-) not found]
- [Link target (target-id 158595-) not found]
- [Link target (target-id 284271-) not found]
- [Link target (target-id 158156-) not found]
- [Link target (target-id 346599-) not found]
- [Link target (target-id 56800-) not found]
- [Link target (target-id 57885-) not found]
- [Link target (target-id 151732-) not found]

Seats

- [Link target (target-id 160302-) not found]
- [Link target (target-id 160303-) not found]

Steering

- [Link target (target-id 55202-) not found]
- [Link target (target-id 65643-) not found]

Suspension

- [Link target (target-id 62585-) not found]
- [Link target (target-id 59474-) not found]

Transmission/Transaxle

- [Link target (target-id 315006-) not found]
- [Link target (target-id 57472-) not found]
- [Link target (target-id 161458-) not found] – MP 1625/1626 (NQF) transfer case
- [Link target (target-id 161481-) not found] – MP 3023/3024 (NQH) transfer case

Engine Does Not Crank

Refer to the appropriate diagnostic procedure below for the symptom observed.

- Starter Malfunction
- Engine Cranks Slowly

Engine Cranks But Does Not Run

Refer to the appropriate diagnostic procedure below for the vehicle being serviced.

- [Link target (target-id 227835-) not found] – 6.6L (L8T) engine
- [Link target (target-id 186752-) not found] – 6.6L (L5P) Diesel engine

Inspection/Maintenance System Check

Refer to the appropriate diagnostic procedure below for the vehicle being serviced.

- [Link target (target-id 228015-) not found] – 6.6L (L8T) engine
- [Link target (target-id 186892-) not found] – 6.6L (L5P) Diesel engine

Diagnostic Repair Verification

Note: After a repair has been made, some DTCs require the ignition to be turned Off and then back On before the scan tool function will clear the DTC.

1. Ignition/Vehicle » Off
2. Install any components or connectors that have been removed or replaced during diagnosis.
3. Perform any adjustment, programming or setup procedures that are required when a component or module is removed or replaced.
4. Perform the following action:
    - 4.1. Ignition » On / Vehicle » In Service Mode
    - 4.2. Clear the DTCs.
    - 4.3. Ignition/Vehicle » Off
    - 4.4. Driver Door» Open& Close
    - 4.5. Wait for greater than 2 min. orInstrument Panel = Off
5. Perform the Circuit/System Verification and verify the result ends with an All OK — If available

    or

    If the repair was related to a DTC, duplicate the Conditions for Running the DTC and use the Freeze Frame/Failure Records, if applicable, in order to verify the DTC does not set. If the DTC sets or another DTC is present » Refer to: *Diagnostic Trouble Code (DTC) List - Vehicle 3-260*

    or

    If the repair was symptom related, duplicate the conditions under which the customer concern occurred to verify the repair. If the customer concern reoccurs or another symptom is present » Refer to: *Symptoms - Vehicle 3-318*

Proactive Alerts List

This master list includes all applicable Proactive Alert Identifiers in alphanumeric order.

Proactive alert identifiers are stored in the K73 Telematics Communication Interface Module and can only be cleared using a scan tool.

Note: If the concern is still present after following the steps for Diagnostics in any of the Proactive Alert Identifiers, contact GM TAC for further assistance. The GM TAC Agent will arrange for the stuck Proactive Alert to be cleared from OnStar Back Office.

Proactive Alerts List

Proactive Alert Service Message	Diagnostic Procedure
SAC001	12 V Starting and Charging- [Link target (target-id 276794-) not found]
SAC002	12 V Starting and Charging- [Link target (target-id 276795-) not found]
SAC003	12 V Starting and Charging- [Link target (target-id 276796-) not found]
SAC004	12 V Starting and Charging- [Link target (target-id 276797-) not found]
SAC005	12 V Starting and Charging- [Link target (target-id 276798-) not found]

Description and Operation

Proactive Alerts Description and Operation

Proactive Alert System Overview

Note: The customer must enroll their vehicle in this program through the OnStar website or with an OnStar advisor to receive Proactive Alerts. When the customer enrolls their vehicle, they select their notification preferences (email address, in-vehicle alert, and/or text message). They also identify their preferred service provider which is often the selling dealer.

This feature collects and stores specific system performance data each ignition cycle. The data is then transmitted via the cellular system (OnStar) when the On/Off Vehicle Switch has been in Run or Accessory power mode for ten minutes. The transmitted data is stored off-board the vehicle and analyzed by special algorithms to detect degraded performance. When monitored system performance degrades to predetermined levels, the off-board system sends a Proactive Alert identifier. The affected system is identified within the alert.

When a Proactive Alert is set, one or more of the following may occur:

- E-mail and/or text message is sent to the customer
- E-mail is sent to the preferred service provider (Customer Experience Manager at GM Dealers)
- A message is sent to the vehicle through the cellular system

When the vehicle receives the Proactive Alert identifier, it is stored in the Communication Interface Module. When stored, the Communication Interface Module may request a specific identifier to display on the radio and/or play an audio message. Each identifier is displayed and/or played one time only when the vehicle is started after the Alert has been set. If there is no performance improvement detected within seven days and then again at fourteen days, the system will send a reminder which contains the same identifier as the original.

When the collected data indicates component performance is normal again, no reminder alerts are sent and the system continues to monitor as before the active alert.

Proactive Alert identifiers stored in the Communication Interface Module will clear once the system is repaired. They can also be cleared using a scan tool, if desired. Ask the customer if they can produce the E-mail and check the date it was sent if you suspect that it is not active. If the customer is unable to provide the documentation, the Proactive Alert can be verified utilizing the scan tool: “Vehicle Diagnostics” >> “Vehicle Proactive Alerts”, or Service Workbench Alerts.

Note: The identifier will not be retained if the Communication Interface Module is replaced.

Note: If the concern is still present after following the steps for Diagnostics in any of the Proactive Alert Identifiers, contact GM TAC for further assistance. The GM TAC Agent will arrange for the stuck Proactive Alert to be cleared from OnStar Back Office.

Power of Green Overview

Note: Power of Green is only available for vehicles that are enrolled in Proactive Alerts.

“Power of Green” utilizes available vehicle data collected through OnStar to establish a history of 12V battery health and determine a Battery Condition. The history is based on Battery voltage, current, and other prognostic-related data, which is collected onboard during every ignition cycle. The current Battery Condition can be accessed for enrolled vehicles via the Dashboard in Techline Connect (TLC). Battery Condition will include a timestamp (date/time) with the OnStar logo if valid.

Battery Condition will be one of the following four statuses:

Green

- “OnStar monitoring indicated good battery condition.”
- No fault detected internal to Battery
- It is unlikely that the Battery will require replacement at this time

Red

- “Battery replacement recommended.”
- SAC001 – Battery Low Cranking Capability Due to Shorted Cell
- Battery testing is NOT required, therefore a print out of the Warranty Code when the battery is replaced for SAC001 is not required.
- Follow SI procedure for Proactive Alert Identifier SAC001

Yellow

- “Starting and Charging proactive alerts detected. Please consult Service Information to diagnose the concern.”
- One of the following:
  - SAC002 – Low Cranking Capability Due to Battery High Resistance
  - SAC003 – Low Cranking Capability Due to Battery Low State of Charge
  - SAC004 – Low Cranking Capability Due to High Resistance in Starter System
  - SAC005 – Low Cranking Capability Due to High Resistance in Battery or Short in Starter System
- Follow SI procedure for appropriate Proactive Alert Identifier

Grey

- “Not enough data available to determine battery condition.”
- One of the following:
  - Vehicle is not enrolled in OnStar Proactive Alerts
  - Inability to contact the Power of Green data service
  - Insufficient recent ignition cycles to make a Red/Yellow/Green determination
- If a Battery issue is suspected, proceed to Battery Inspection/Test

Updated Battery Condition data may be obtained by selecting “Refresh” button next to the timestamp.

Note: Since the Green status is dependent on a history of battery health, the Battery Condition may not update immediately and turn Green if the battery is replaced.

While the vehicle is being serviced, the Battery Condition may change from Green depending on Service actions (e.g. if battery is disconnected or becomes discharged, status may change).

Section 4

Driveline/Axle

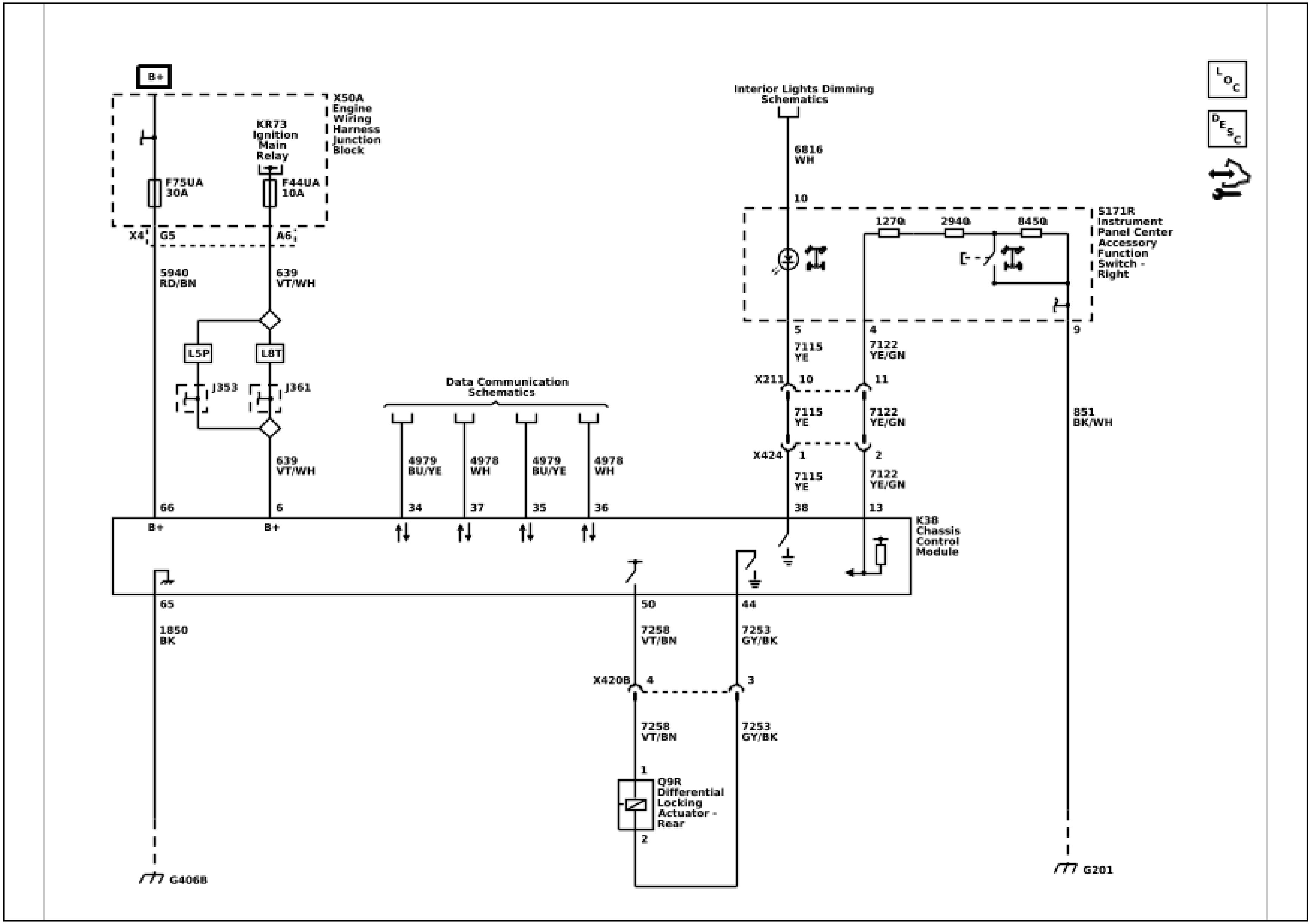
Rear Drive Axle 4-2
  Schematic and Routing Diagrams 4-2
    Differential Lock Schematics 4-3
  Description and Operation 4-4
    Locking Differential Description and Operation 4-4
    Rear Drive Axle Description and Operation 4-5

Driveline/Axle

Rear Drive Axle

Schematic and Routing Diagrams

Differential Lock Schematics (Locking Differential (G94))


B+
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F75UA 30A
F44UA 10A
X4
G5
A6
5940 RD/BN
639 VT/WH
L5P
L8T
J353
J361
639 VT/WH
66
6
B+
B+
Data Communication Schematics
4979 BU/YE
4978 WH
4979 BU/YE
4978 WH
34
37
35
36
65
1850 BK
G4068
Interior Lights Dimming Schematics
6816 WH
10
S171R Instrument Panel Center Accessory Function Switch - Right
1270Ω
2940Ω
8450Ω
5
4
9
7115 YE
7122 YE/GN
X211
10
11
7115 YE
7122 YE/GN
X424
1
2
7115 YE
7122 YE/GN
38
13
851 BK/WH
K38 Chassis Control Module
50
44
7258 VT/BN
7253 GY/BK
X420B
4
3
7258 VT/BN
7253 GY/BK
1
Q9R Differential Locking Actuator - Rear
2
G201
LOC
DESC

6846215

Description and Operation

Locking Differential Description and Operation

The locking differential consists of the following components:

- Differential case – 1 or 2 piece
- Locking differential spider – 2 piece case only
- Pinion gear shaft – 1 piece case only
- Differential pinion gear shaft lock bolt – 1 piece case only
- Two clutch discs sets
- Locking differential side gear
- Thrust block
- Locking differential clutch disc guides
- Differential side gear shim
- Locking differential clutch disc thrust washer
- Locking differential governor
- Latching bracket
- Cam plate assembly
- Differential pinion gears
- Differential pinion gear thrust washers

The optional locking differential (RPO G80) enhances the traction capability of the rear axle by combining the characteristics of a limited-slip differential and the ability of the axle shafts to “lock” together when uneven traction surfaces exist. The differential accomplishes this in 2 ways. First by having a series of clutch plates at each side of the differential case to limit the amount of slippage between each wheel. Second, by using a mechanical locking mechanism to stop the rotation of the right differential side gear, in order to transfer the rotating torque of the wheel without traction to the wheel with traction. Each of these functions occur under different conditions.

Limited-Slip Function

Under normal conditions, when the differential is not locked, a small amount of limited-slip action occurs. The gear separating force developed in the right-hand clutch pack is primarily responsible for this.

The operation of how the limited-slip function of the unit works can be explained when the vehicle makes a right-hand turn. Since the left wheel travels farther than the right wheel, it must rotate faster than the ring gear and differential case assembly. This results in the left axle and left side gear rotating faster than the differential case. The faster rotation of the left-side gear causes the pinion gears to rotate on the pinion shaft. This causes the right-side gear to rotate slower than the differential case.

Although the side gear spreading force produced by the pinion gears compresses the clutch packs, primarily the right side, the friction between the tires and the road surface is sufficient to overcome the friction of the clutch packs. This prevents the side gears from being held to the differential case.

Locking Function

Locking action occurs through the use of some special parts:

- A governor mechanism with 2 flyweights
- A latching bracket
- The left side cam plate and cam side gear

When the wheel-to-wheel speed difference is 100 RPM or more, the flyweights of the governor will fling out and one of them will contact an edge of the latching bracket. This happens because the left cam side gear and cam plate are rotating at a speed different, either slower or faster, than that of the ring gear and differential case assembly. The cam plate has teeth on its outer diameter surface in mesh with teeth on the shaft of the governor.

As the side gear rotates at a speed different than that of the differential case, the shaft of the governor rotates with enough speed to force the flyweights outward against spring tension. One of the flyweights catches its edge on the closest edge of the latching bracket, which is stationary in the differential case. This latching process triggers a chain of events.

When the governor latches, it stops rotating. A small friction clutch inside the governor allows rotation, with resistance, of the governor shaft while one flyweight is held to the differential case through the latching bracket. The purpose of the governor's latching action is to slow the rotation of the cam plate as compared to the cam side gear. This will cause the cam plate to move out of its detent position.

The cam plate normally is held in its detent position by a small wave spring and detent humps resting in matching notches of the cam side gear. At this point, the ramps of the cam plate ride up on the ramps of the cam side gear, and the cam plate compresses the left clutch pack with a self-energizing action.

As the left clutch pack is compressed, it pushes the cam plate and cam side gear slightly toward the right side of the differential case. This movement of the cam side gear pushes the thrust block which compresses the right-hand side gear clutch pack.

At this point, the force of the self-energizing clutches and the side gear separating force combine to hold the side gears to the differential case in the locking stage.

The entire locking process occurs in less than 1 second. The process works with either the left or right wheel spinning, due to the design of the governor and cam mechanism. A torque reversal of any kind will unlatch the governor, causing the cam plate to ride back down to its detent position. Cornering or deceleration during a transmission shift will cause a torque reversal of this type. The differential unit returns to its limited-slip function.

The self-energizing process would not occur if it were not for the action of one of the left clutch discs. This energizing disc provides the holding force of the ramping action to occur. It is the only disc which is splined to the cam plate itself. The other splined discs fit on the cam side gear.

If the rotating speed of the ring gear and differential case assembly is high enough, the latching bracket will pivot due to centrifugal force. This will move the flyweights so that no locking is permitted. During vehicle driving, this happens at approximately 32 km/h (20 mph) and continues at faster speeds.

When comparing the effectiveness of the locking differential, in terms of percent-of-grade capability to open and limited-slip units, the locking differential has nearly 3 times the potential of the limited-slip unit under the same conditions.

Locking Differential Torque-Limiting Disc

The locking differential design was modified in mid-1986 to include a load-limiting feature to reduce the chance of breaking an axle shaft under abusive driving conditions. The number of tangs on the energizing disc in the left-hand clutch pack was reduced allowing these tangs to shear in the event of a high-torque engagement of the differential locking mechanism.

At the time of failure of the load-limiting disc, there will be a loud bang in the rear axle and the differential will operate as a standard differential with some limited-slip action of the clutch packs at low torques.

The service procedure, when the disc tangs shear, involves replacing the left-hand clutch plates and the wave spring. It is also necessary to examine the axle shafts for twisting because at high torques it is possible to not only shear the load-limiting disc, but to also twist the axle shafts.

Rear Drive Axle Description and Operation

Rear axles for this vehicle consist of the following primary components:

- Axle Shaft – Left
- Axle Shaft – Right
- Differential
- Differential Drive Pinion Gear
- Differential Drive Ring Gear
- Rear Axle Housing
- Wheel Hub – Left
- Wheel Hub – Right

The rear axle is a full-floating axle. The full-floating axle shafts are splined into the differential and are retained by 8 bolts that connect the axle shaft to the wheel hub assembly. The rear axle can be identified by the stamping on the right side axle tube. The rear axle may also be identified by the ring gear size. The ring gear sizes include 11.50 and 12.00 inch axles. The rear axle differential can be an open differential or limited slip/ locking differential. For a description and operation of the limited slip/locking differentials refer to: *Locking Differential Description and Operation 4-4*.

An open differential has 2 types of gears, pinion gears and side gears. There are 2 side gears within the differential that the axle shafts spline into, so each side gear and axle shaft rotate together. Typically there are 2 pinion gears, but some differentials have more than 2 pinion gears. The pinion gears are mounted on a differential pinion shaft, and the gears are free to rotate around this shaft. The pinion shaft(s) is fitted into a bore in the differential case and is at a right angle to the axle shafts.

Power is transmitted through the differential as follows: The differential drive pinion rotates the differential ring gear. The ring gear, being bolted to the differential case, rotates the case. As the pinion gears and pinion shaft are located in the case they are rotated by the case, forcing the pinion gears into the side gears causing the side gears to rotate. The side gears, being splined to the axle shafts and in mesh with the pinion gears, rotate the axle shafts.

When both wheels have equal traction and when the vehicle is driving in a straight line, the pinion gears do not rotate on the pinion shaft because the input force on the pinion gear is equally divided between the two side gears. Therefore, the pinion gears revolve with the pinion shaft, but do not rotate around the shaft itself.

When the vehicle turns a corner or when the wheels do not have equal traction, the one wheel turns slower than the other wheel, in turn slowing one rear axle side gear (as the axle shaft splines into the side gear). The rear axle pinion gears will roll around the slower rear axle side gear, driving the other rear axle side gear faster.

Section 5

Driver Information and Entertainment

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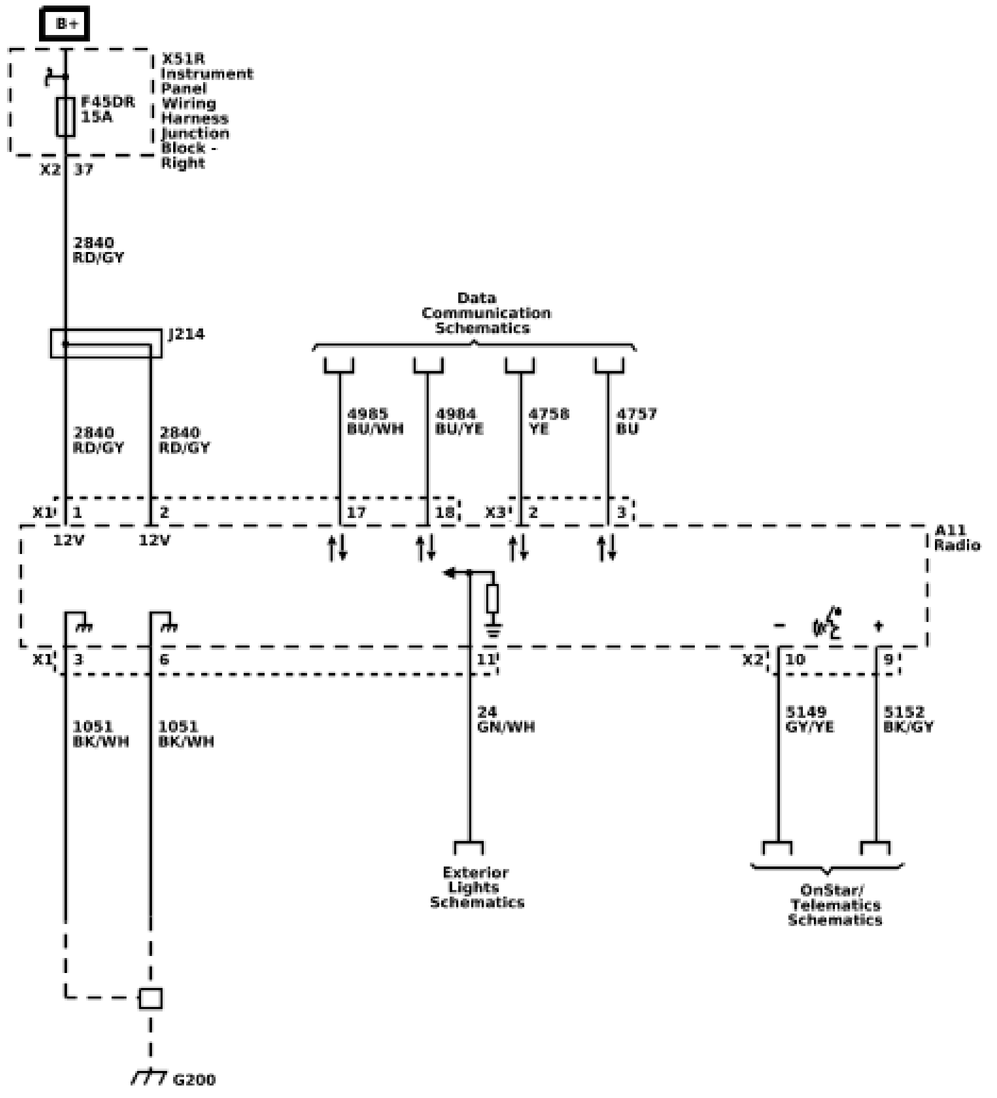
Driver Information and Entertainment

Cellular, Entertainment, and Navigation

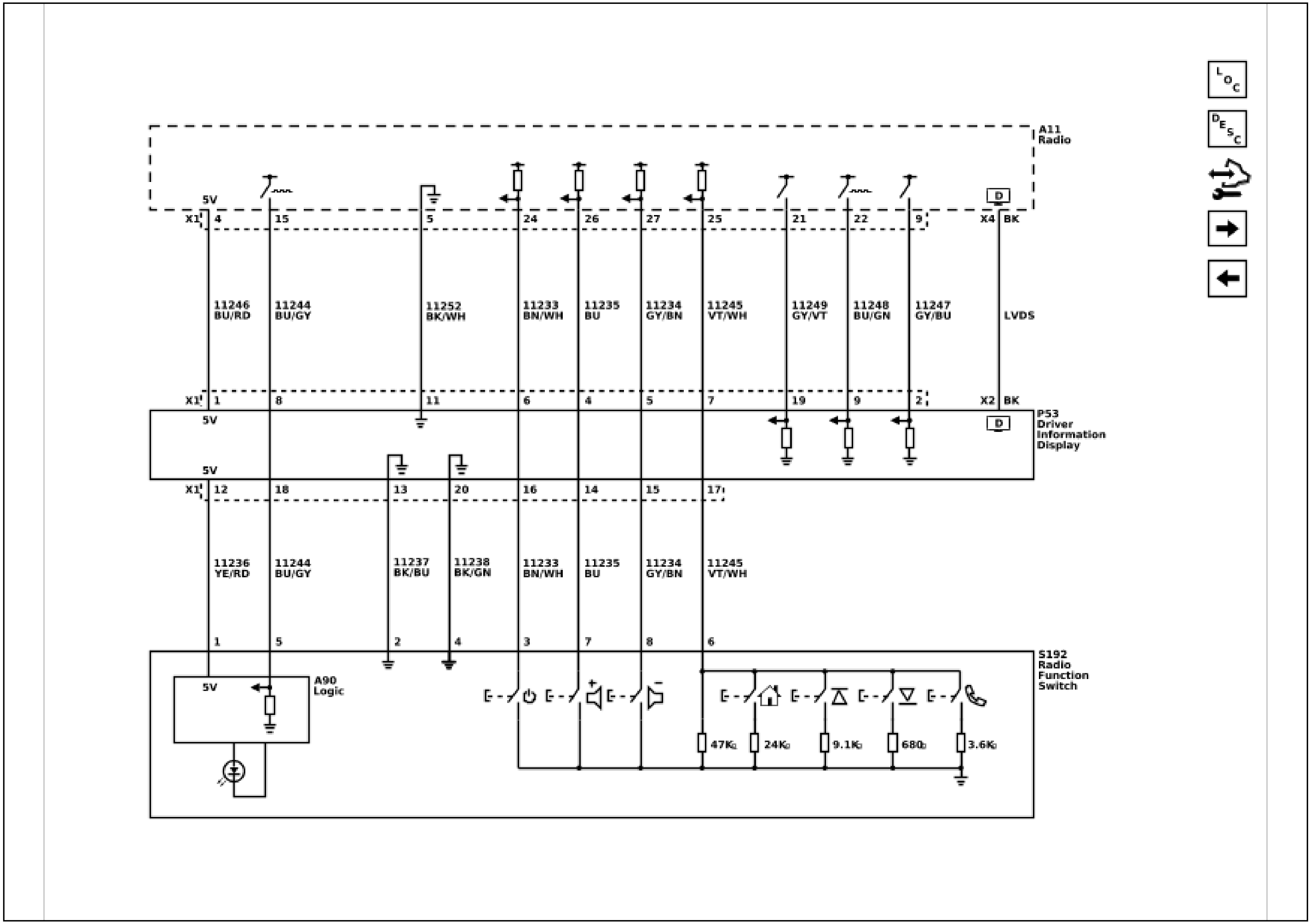
Schematic and Routing Diagrams

Radio/Navigation System Schematics (IOR) (Power, Ground, Serial Data, Microphone and Subsystem References)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F45DR 15A
X2 37
2840 RD/GY
J214
2840 RD/GY
2840 RD/GY
Data Communication Schematics
4985 BU/WH
4984 BU/YE
4758 YE
4757 BU
X1 1
2
17
18
X3 2
3
12V
12V
A11 Radio
-
+
X1 3
6
11
X2 10
9
1051 BK/WH
1051 BK/WH
24 GN/WH
5149 GY/YE
5152 BK/GY
Exterior Lights Schematics
OnStar/ Telematics Schematics
G200

6846216

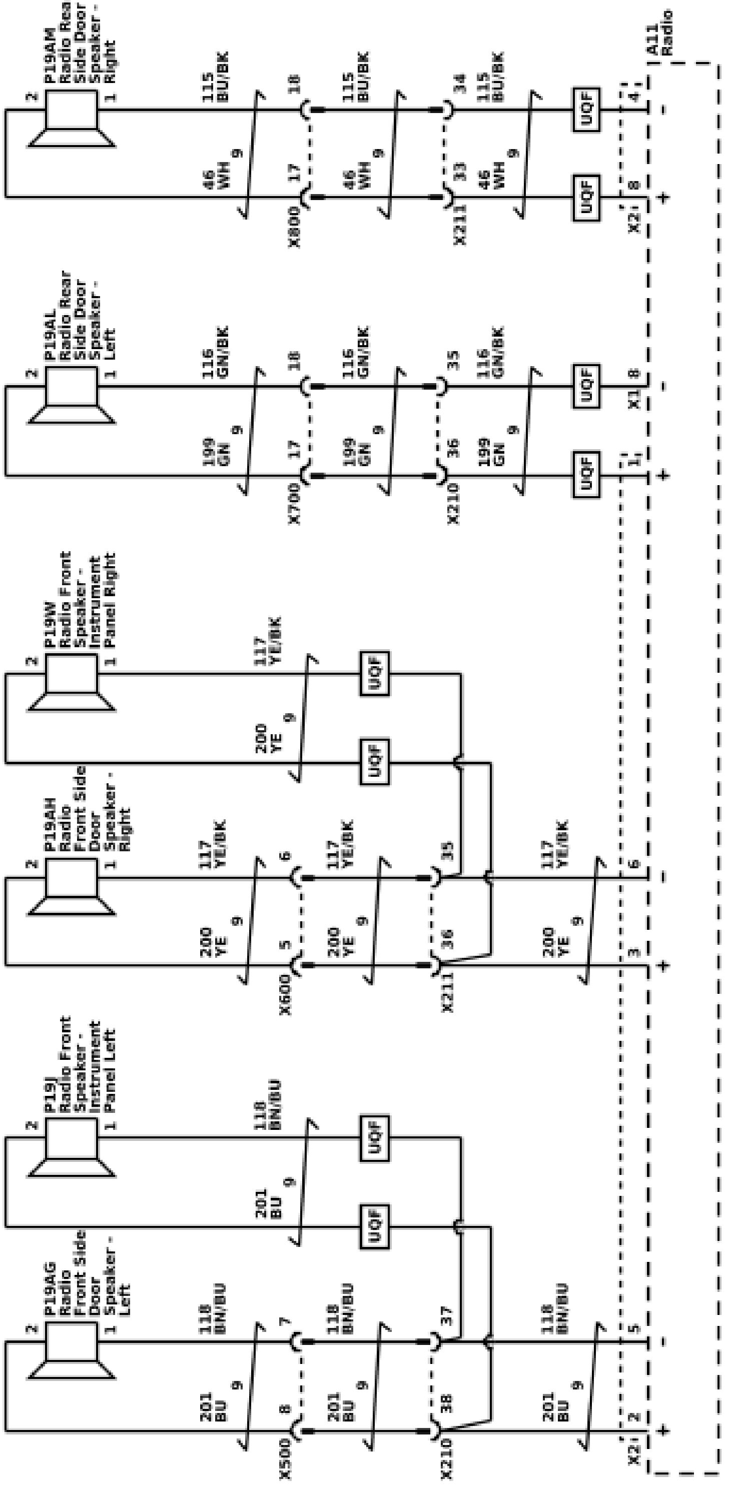
Radio/Navigation System Schematics (IOR) (Infotainment Display and Radio Controls (UIR))


A11
Radio
5V
X1
4
15
5
24
26
27
25
21
22
9
X4
BK
D
11246
BU/RD
11244
BU/GY
11252
BK/WH
11233
BN/WH
11235
BU
11234
GY/BN
11245
VT/WH
11249
GY/VT
11248
BU/GN
11247
GY/BU
LVDS
X1
1
8
11
6
4
5
7
19
9
2
X2
BK
5V
P53
Driver
Information
Display
D
5V
X1
12
18
13
20
16
14
15
17
11236
YE/RD
11244
BU/GY
11237
BK/BU
11238
BK/GN
11233
BN/WH
11235
BU
11234
GY/BN
11245
VT/WH
1
5
2
4
3
7
8
6
S192
Radio
Function
Switch
5V
A90
Logic
+
−
47K
24K
9.1K
680
3.6K

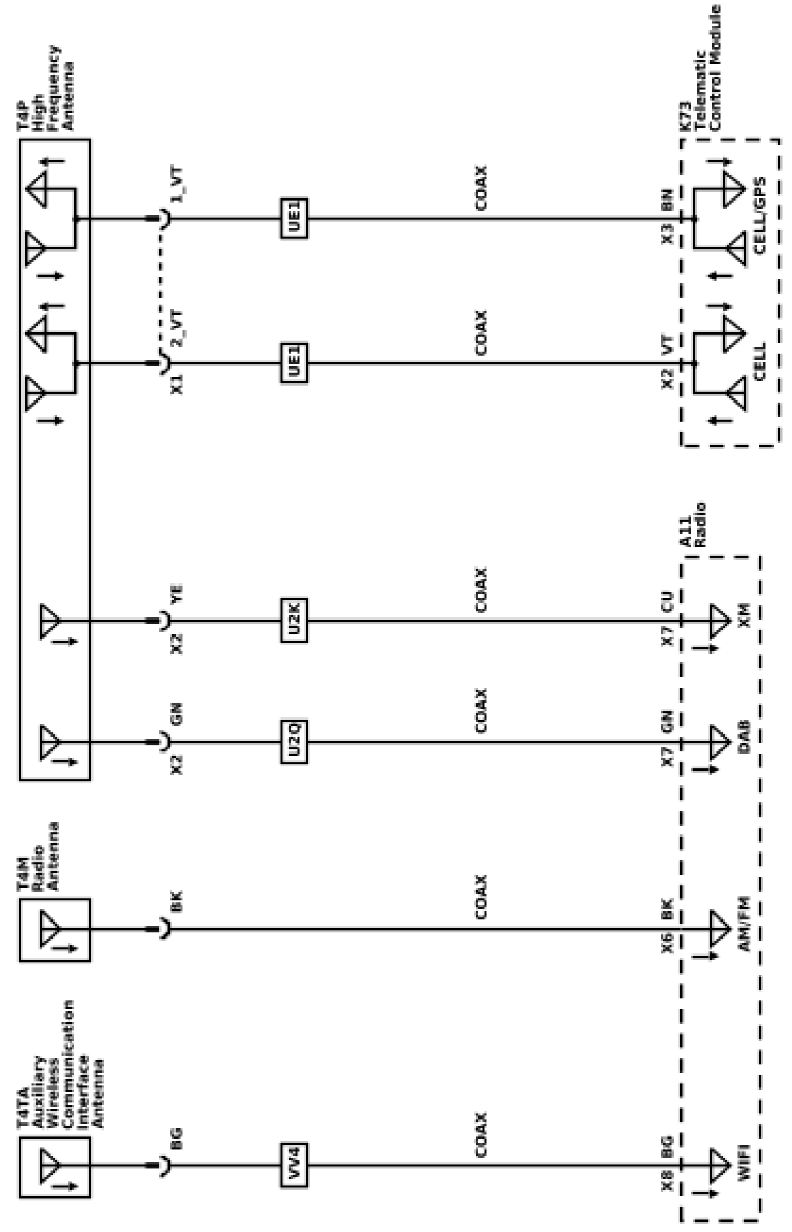
6846217

Radio/Navigation System Schematics (IOR) (Speakers)

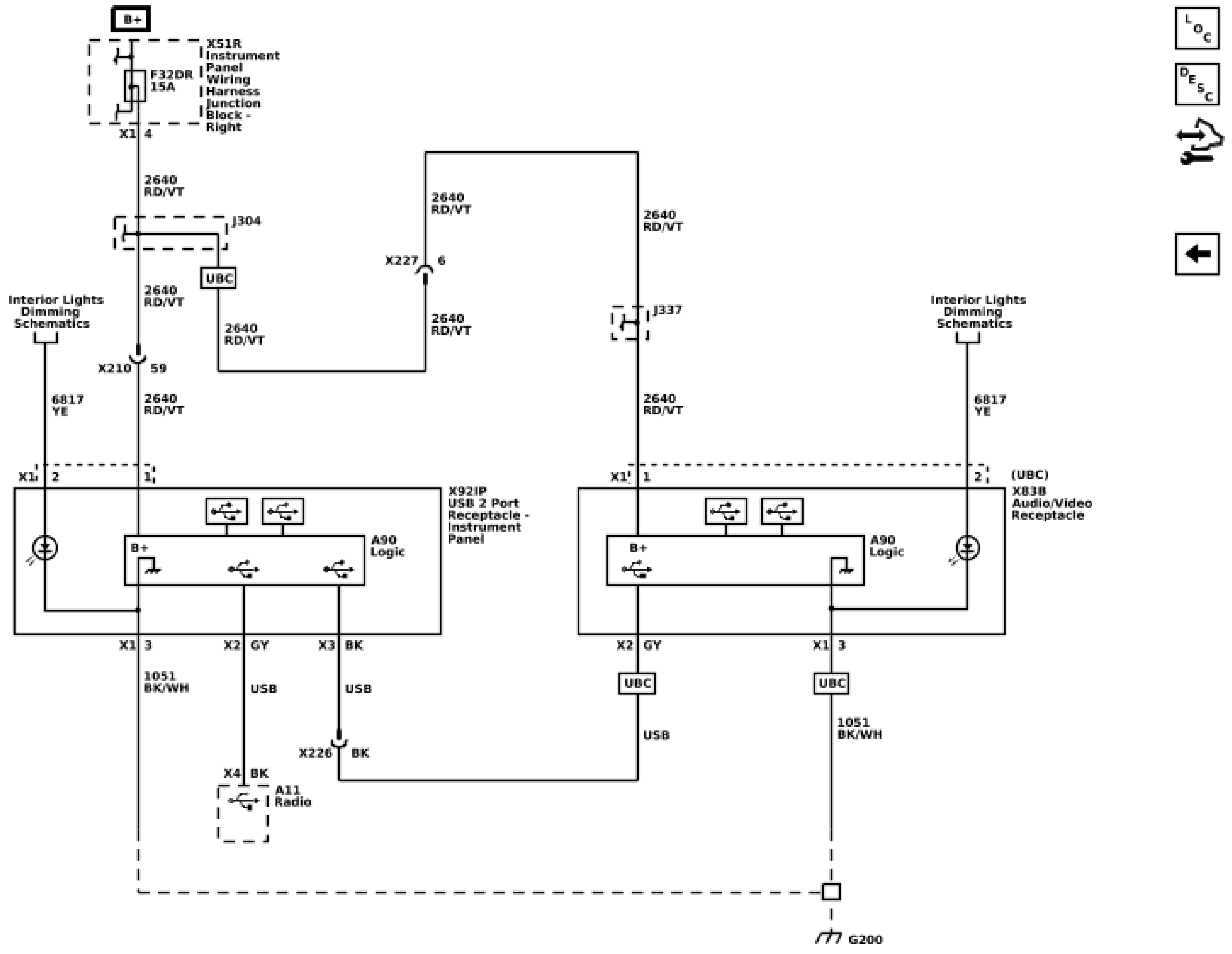
6846218


P19AM
Radio Rear Side Door Speaker - Right
P19AL
Radio Rear Side Door Speaker - Left
P19W
Radio Front Speaker - Instrument Panel Right
P19AH
Radio Front Side Door Speaker - Right
P19J
Radio Front Speaker - Instrument Panel Left
P19AG
Radio Front Side Door Speaker - Left
A11
Radio
115 BU/BK
46 WH
116 GN/BK
199 GN
117 YE/BK
200 YE
118 BN/BU
201 BU
9
UQF
X800
X700
X600
X500
X211
X210
X2
X1
1
2
3
4
5
6
7
8
17
18
33
34
35
36
37
38
+
-

Radio/Navigation System Schematics (IOR) (Antennas)

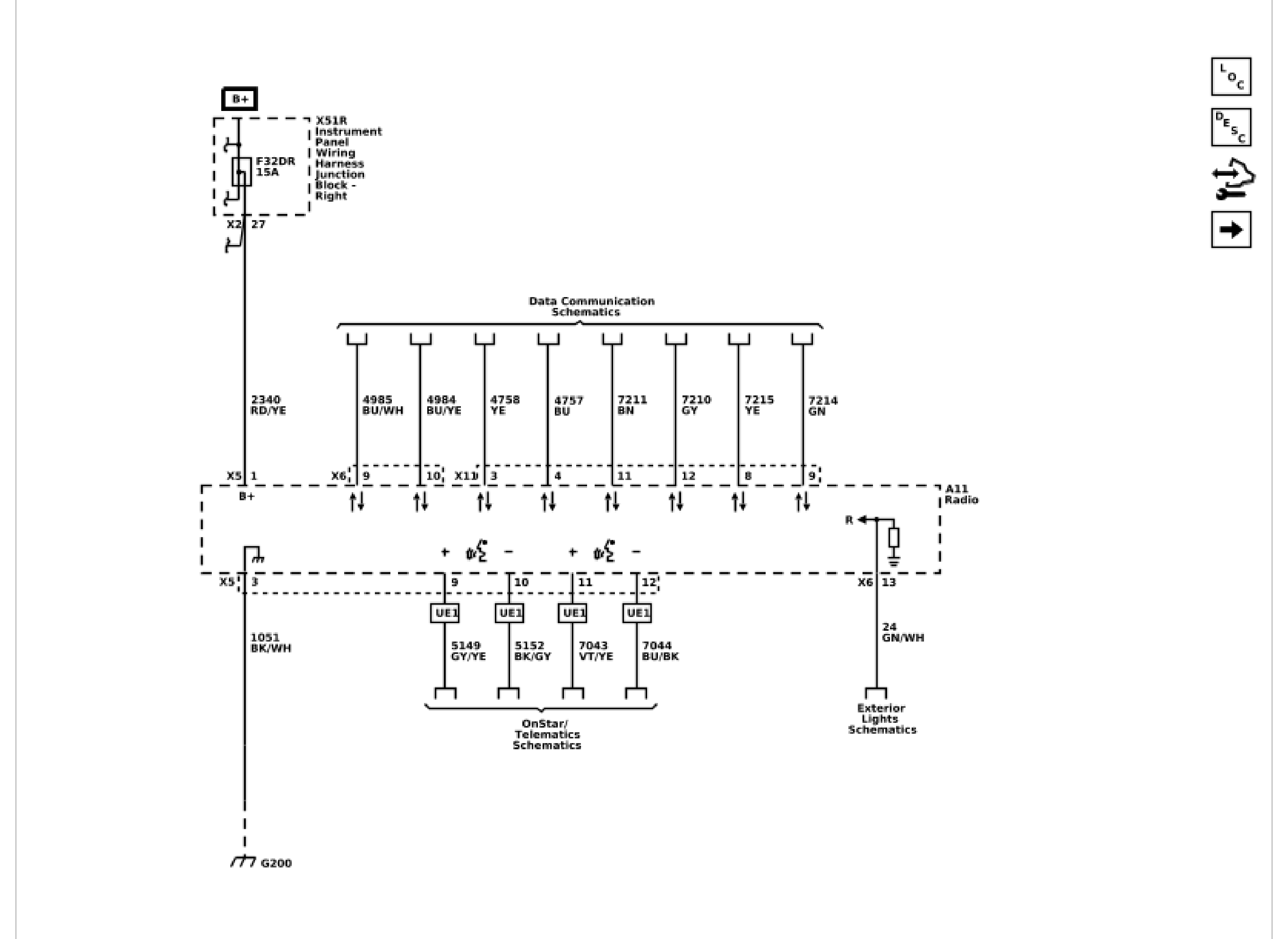

6846219
T4P High Frequency Antenna
X1
1_VT
2_VT
UE1
UE1
COAX
COAX
K73 Telematic Control Module
X3 BN
X2 VT
CELL/GPS
CELL
A11 Radio
X2 YE
U2K
COAX
X7 CU
XM
X2 GN
U2Q
COAX
X7 GN
DAB
T4M Radio Antenna
BK
COAX
X6 BK
AM/FM
T4TA Auxiliary Wireless Communication Interface Antenna
BG
VV4
COAX
X8 BG
WIFI

Radio/Navigation System Schematics (IOR) (Auxiliary Inputs)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F32DR 15A
X1 4
2640 RD/VT
J304
UBC
2640 RD/VT
2640 RD/VT
X210 59
2640 RD/VT
X227 6
2640 RD/VT
2640 RD/VT
2640 RD/VT
J337
2640 RD/VT
Interior Lights Dimming Schematics
6817 YE
Interior Lights Dimming Schematics
6817 YE
X1 2
1
X92IP USB 2 Port Receptacle - Instrument Panel
A90 Logic
B+
X1 3
X2 GY
X3 BK
1051 BK/WH
USB
USB
X226 BK
X4 BK
A11 Radio
X1 1
2
(UBC)
X83B Audio/Video Receptacle
A90 Logic
B+
X2 GY
X1 3
UBC
UBC
USB
1051 BK/WH
G200

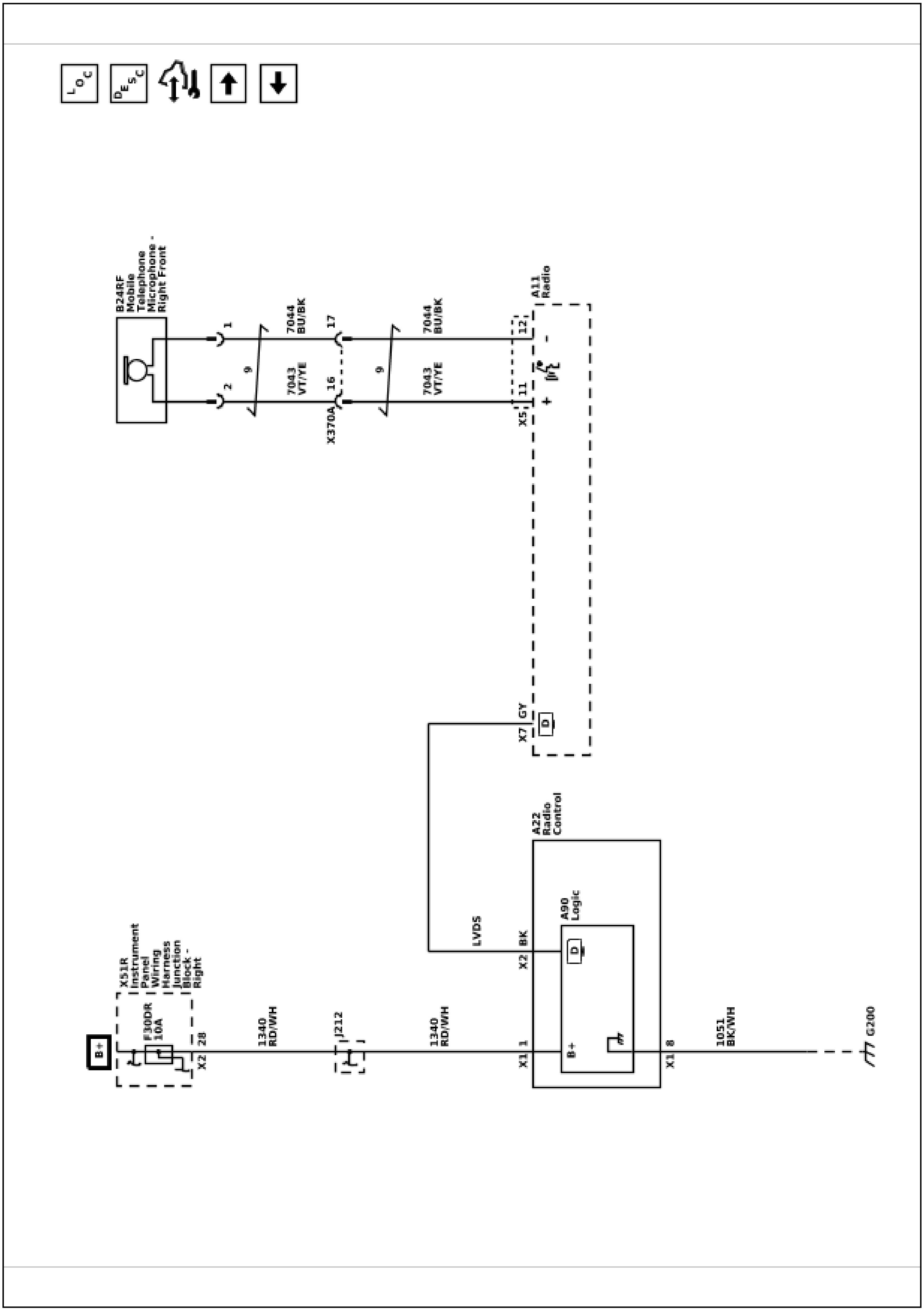
6846220

Radio/Navigation System Schematics (IOK) (Radio, Power, Ground, Serial Data, Microphone and Subsystem References)

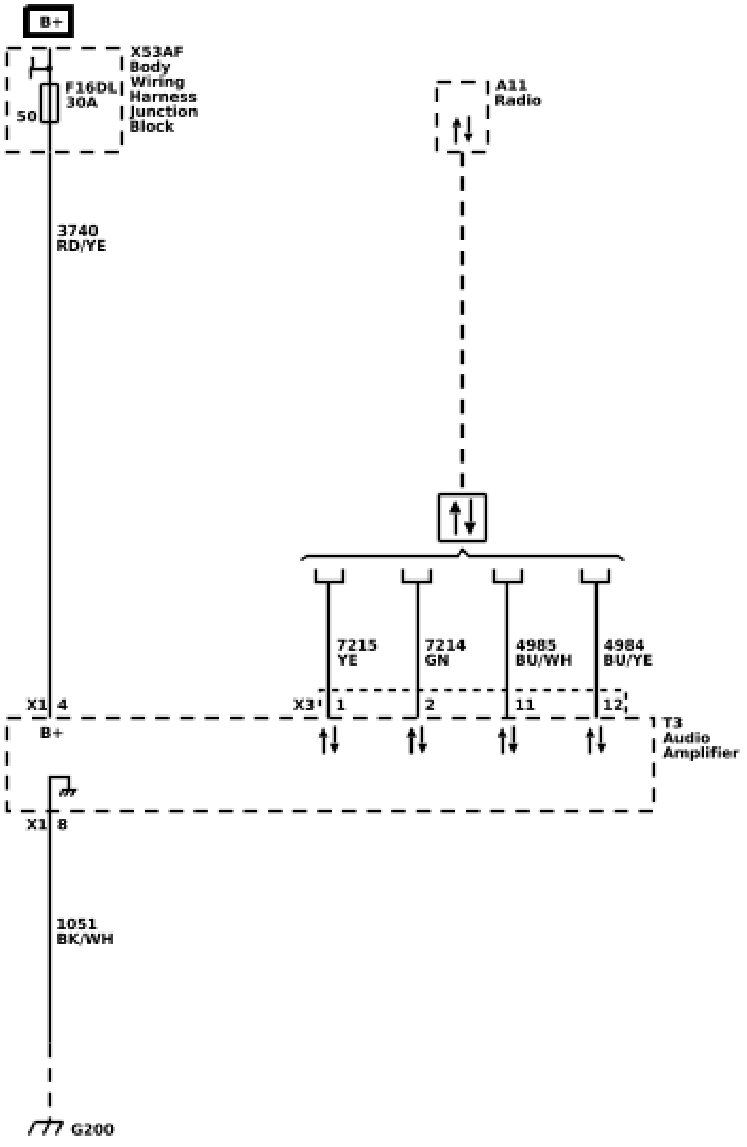

B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F32DR 15A
X2 27
2340 RD/YE
Data Communication Schematics
4985 BU/WH
4984 BU/YE
4758 YE
4757 BU
7211 BN
7210 GY
7215 YE
7214 GN
X5 1
B+
X6 9
10
X11 3
4
11
12
8
9
A11 Radio
R
X5 3
9
10
11
12
X6 13
UE1
UE1
UE1
UE1
1051 BK/WH
5149 GY/YE
5152 BK/GY
7043 VT/YE
7044 BU/BK
24 GN/WH
OnStar/ Telematics Schematics
Exterior Lights Schematics
G200

6846221

Radio/Navigation System Schematics (IOK) (Radio Controls and Microphones)

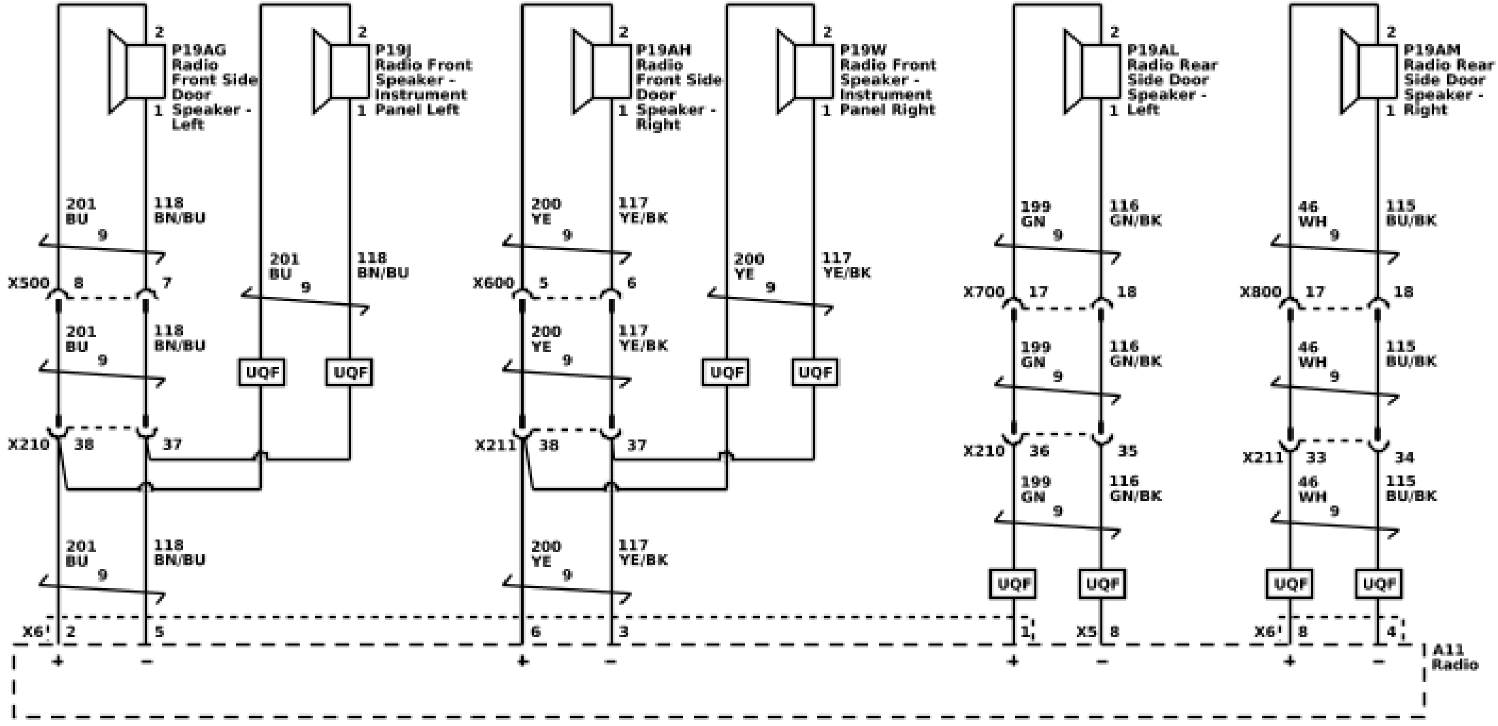

6846222
LOC
DESC
B24RF
Mobile
Telephone
Microphone -
Right Front
1
2
9
7044
BU/BK
7043
VT/YE
17
16
X370A
9
7044
BU/BK
7043
VT/YE
12
11
X5
+
-
A11
Radio
X7
GY
D
A22
Radio
Control
A90
Logic
D
LVDS
X2
BK
B+
X51R
Instrument
Panel
Wiring
Harness
Junction
Block -
Right
F30DR
10A
X2
28
1340
RD/WH
J212
1340
RD/WH
X1
1
B+
X1
8
1051
BK/WH
G200

Radio/Navigation System Schematics (IOK) (Audio Amplifier Power, Ground and Serial Data (UQA))


B+
X53AF Body Wiring Harness Junction Block
F16DL 30A
50
3740 RD/YE
A11 Radio
7215 YE
7214 GN
4985 BU/WH
4984 BU/YE
X1 4
B+
X3 1
2
11
12
T3 Audio Amplifier
X1 8
1051 BK/WH
G200

6846223

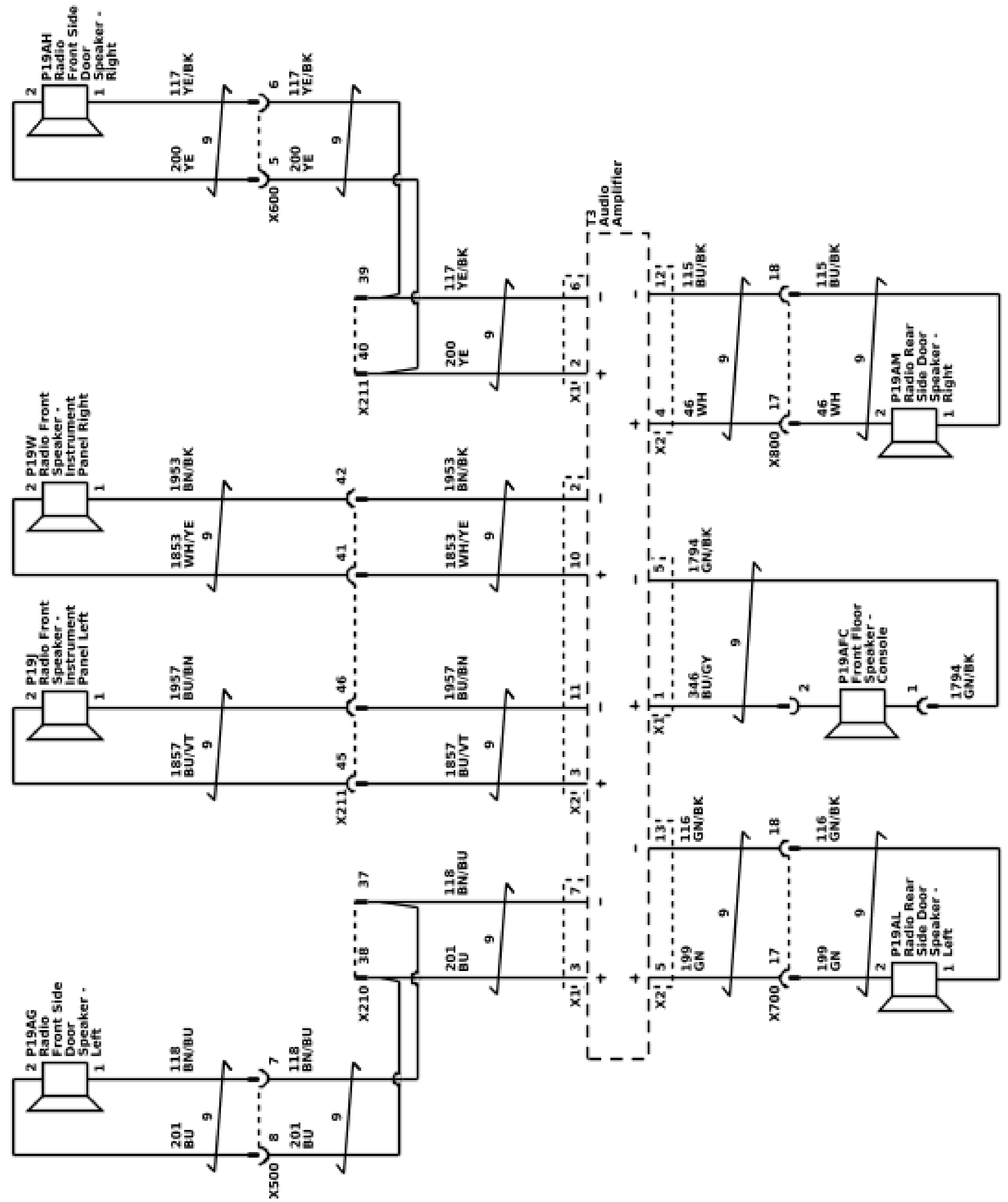
Radio/Navigation System Schematics (IOK) (Speakers (U95 / UQF))


P19AG Radio Front Side Door Speaker - Left
P19J Radio Front Speaker - Instrument Panel Left
P19AH Radio Front Side Door Speaker - Right
P19W Radio Front Speaker - Instrument Panel Right
P19AL Radio Rear Side Door Speaker - Left
P19AM Radio Rear Side Door Speaker - Right
1
2
201 BU 9
118 BN/BU
200 YE 9
117 YE/BK
199 GN 9
116 GN/BK
46 WH 9
115 BU/BK
X500 8 7
X600 5 6
X700 17 18
X800 17 18
X210 38 37
X211 38 37
X210 36 35
X211 33 34
UQF
X6 2 5 6 3
1
X5 8
X6 8 4
+
−
A11 Radio

6846224

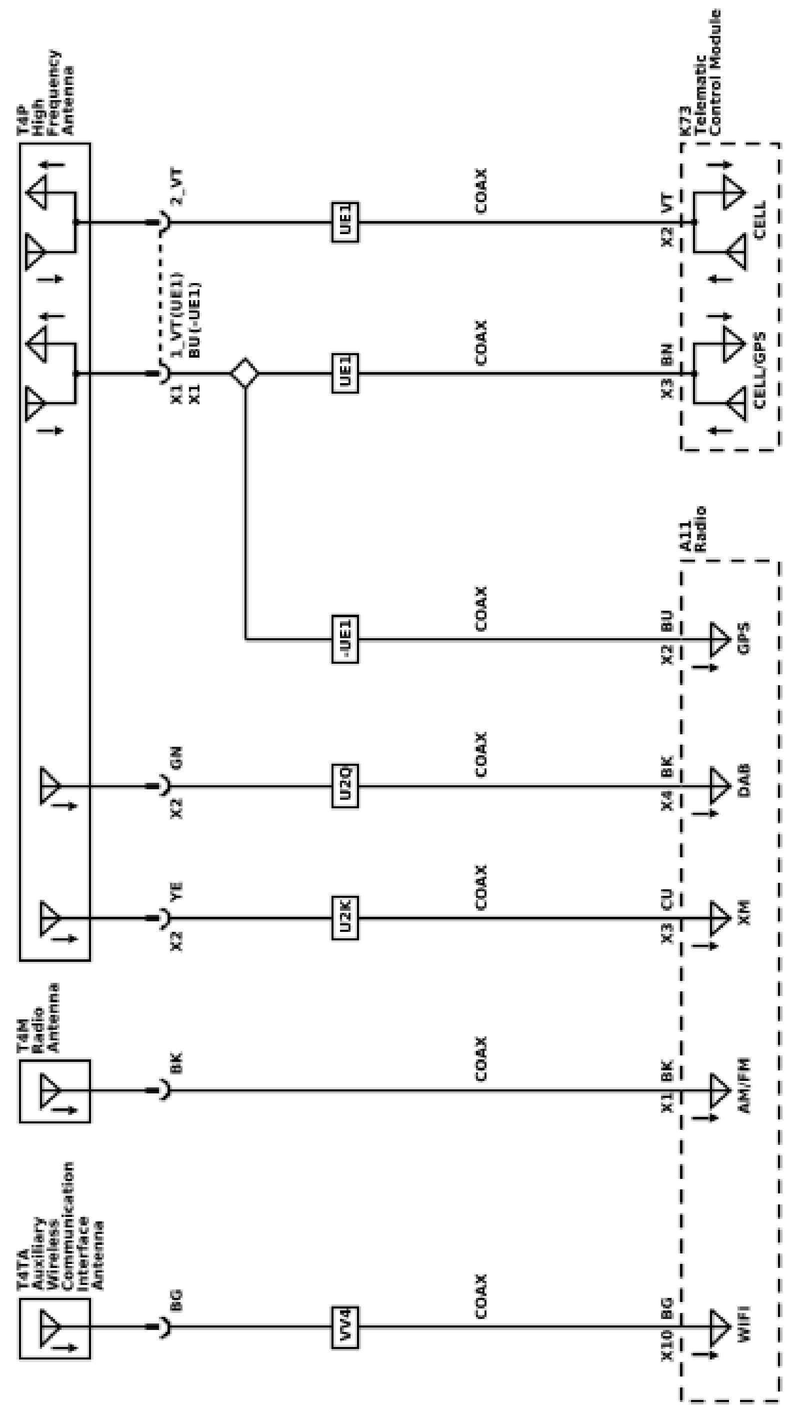
Radio/Navigation System Schematics (IOK) (Speakers (UQA))

6846225

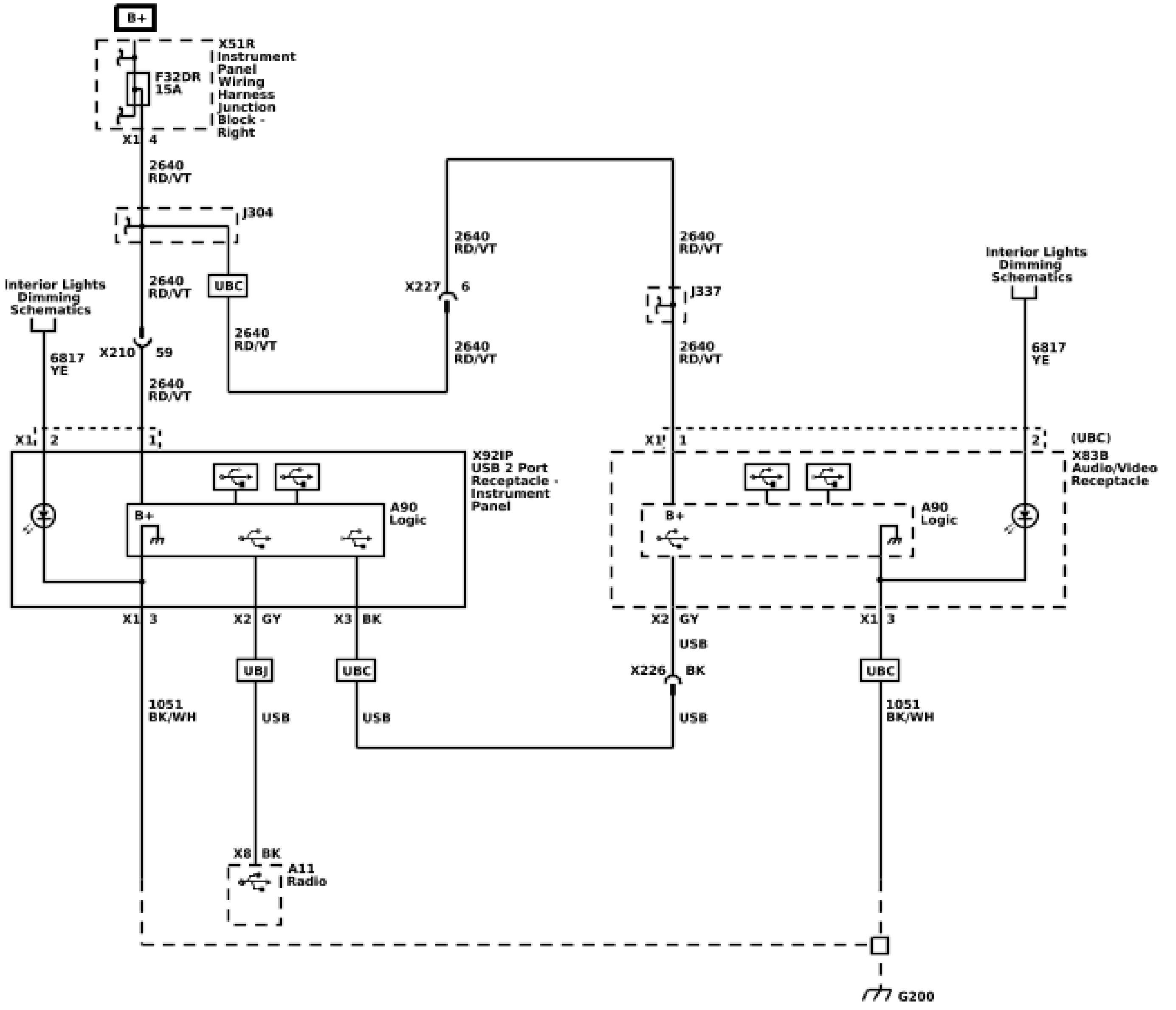

P19AH Radio Front Side Door Speaker - Right
P19W Radio Front Speaker - Instrument Panel Right
P19J Radio Front Speaker - Instrument Panel Left
P19AG Radio Front Side Door Speaker - Left
P19AM Radio Rear Side Door Speaker - Right
P19AFC Front Floor Speaker - Console
P19AL Radio Rear Side Door Speaker - Left
T3 Audio Amplifier
X600
X500
X211
X210
X1
X2
X800
X700
117 YE/BK
200 YE
1953 BN/BK
1853 WH/YE
1957 BU/BN
1857 BU/VT
118 BN/BU
201 BU
115 BU/BK
46 WH
1794 GN/BK
346 BU/GY
116 GN/BK
199 GN
9
+
-

Radio/Navigation System Schematics (IOK) (Antennas)

6846226

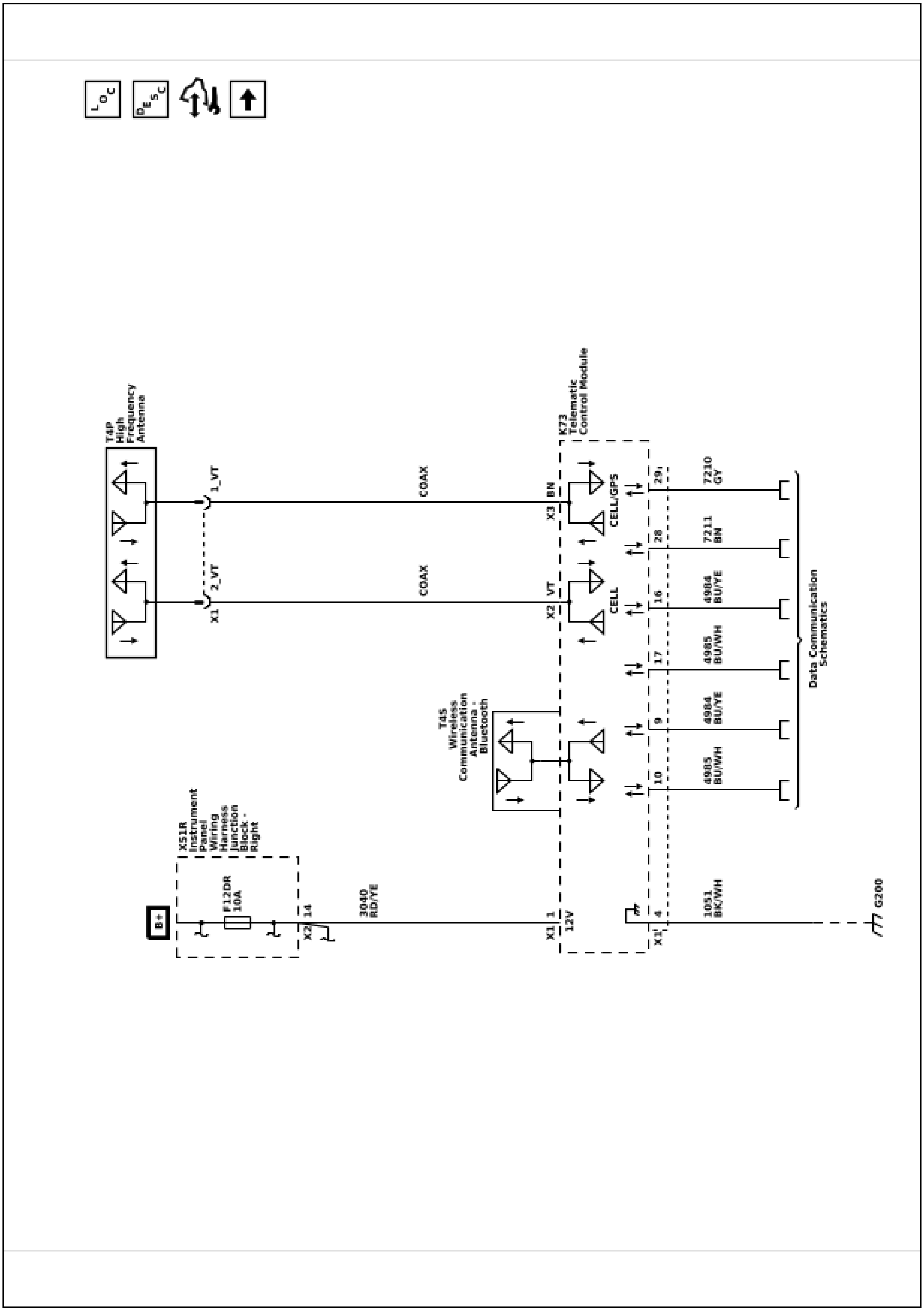

T4P
High
Frequency
Antenna
K73
Telematic
Control Module
A11
Radio
T4M
Radio
Antenna
T4TA
Auxiliary
Wireless
Communication
Interface
Antenna
2_VT
X1 1_VT(UE1)
X1 BU(-UE1)
UE1
UE1
-UE1
U2Q
U2K
VV4
COAX
X2 VT
CELL
X3 BN
CELL/GPS
X2 BU
GPS
X2 GN
X4 BK
DAB
X2 YE
X3 CU
XM
BK
X1 BK
AM/FM
BG
X10 BG
WIFI

Radio/Navigation System Schematics (IOK) (Auxiliary Inputs (D07))

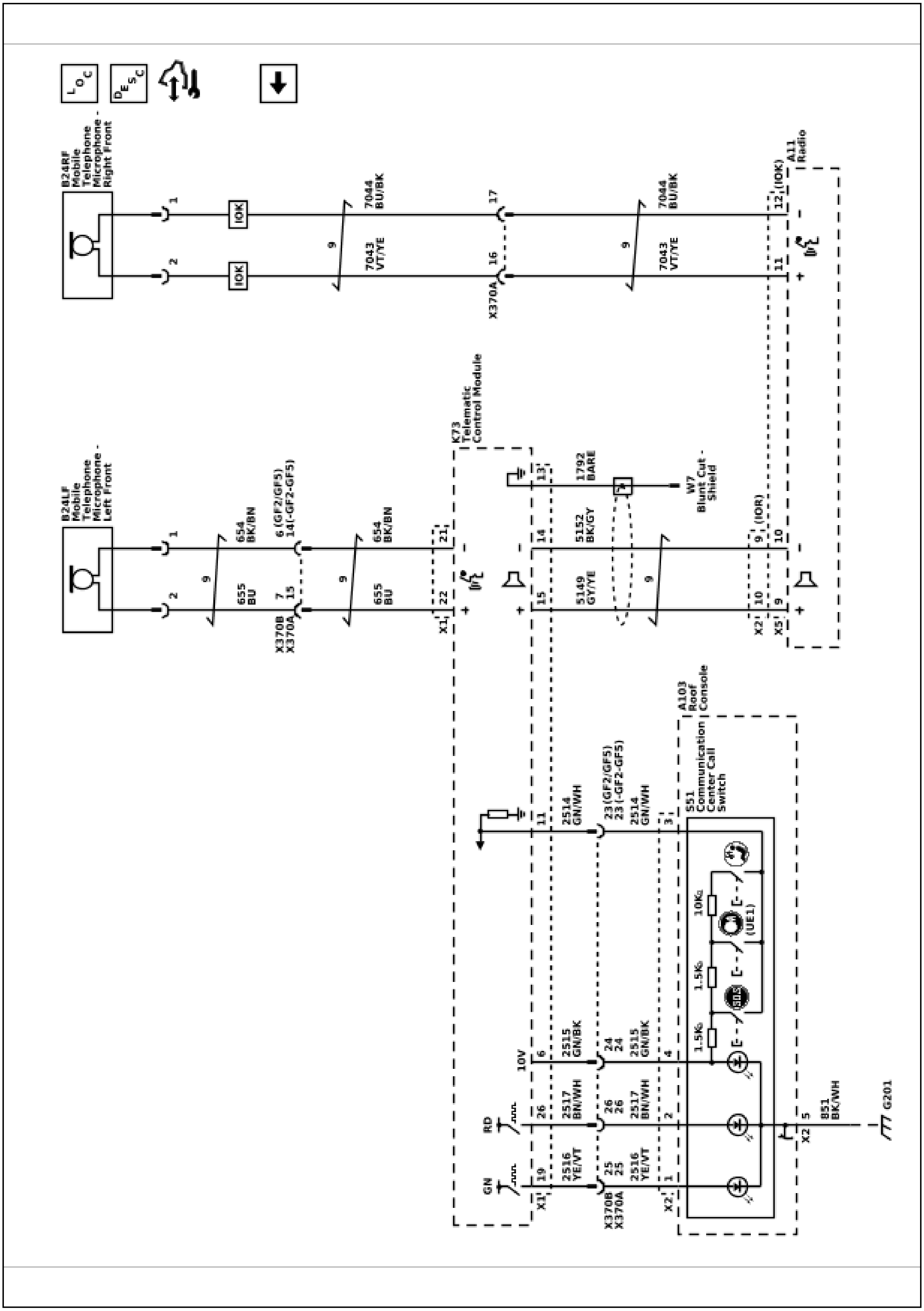

B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F32DR 15A
X1 4
2640 RD/VT
J304
UBC
2640 RD/VT
Interior Lights Dimming Schematics
6817 YE
X210 59
2640 RD/VT
2640 RD/VT
X227 6
2640 RD/VT
2640 RD/VT
2640 RD/VT
J337
2640 RD/VT
Interior Lights Dimming Schematics
6817 YE
X1 2
1
X92IP USB 2 Port Receptacle - Instrument Panel
B+
A90 Logic
X1 1
2
(UBC)
X83B Audio/Video Receptacle
B+
A90 Logic
X1 3
X2 GY
X3 BK
UBJ
UBC
1051 BK/WH
USB
USB
X2 GY
USB
X226 BK
USB
X1 3
UBC
1051 BK/WH
X8 BK
A11 Radio
G200

6846227

OnStar/Telematics Schematics (Power, Ground, Serial Data and Antenna)


6846228
LOC
DESC
T4P High Frequency Antenna
X1
1_VT
2_VT
COAX
COAX
K73 Telematic Control Module
X3 BN
X2 VT
CELL/GPS
CELL
T45 Wireless Communication Antenna - Bluetooth
29
28
16
17
9
10
7210 GY
7211 BN
4984 BU/YE
4985 BU/WH
4984 BU/YE
4985 BU/WH
Data Communication Schematics
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F12DR 10A
X2 14
3040 RD/YE
X1 1
12V
X1 4
1051 BK/WH
G200

OnStar/Telematics Schematics (Controls and Audio Signal)


6846229
B24RF Mobile Telephone Microphone - Right Front
B24LF Mobile Telephone Microphone - Left Front
1
2
IOK
IOK
9
7044 BU/BK
7043 VT/YE
17
16
X370A
654 BK/BN
655 BU
6 (GF2/GF5) 14(-GF2-GF5)
7 15
X370B X370A
21
22
X1
K73 Telematic Control Module
13
14
15
1792 BARE
5152 BK/GY
5149 GY/YE
W7 Blunt Cut - Shield
9 (IOR)
10
X2
X5
12 (IOK)
11
A11 Radio
A103 Roof Console
S51 Communication Center Call Switch
11
2514 GN/WH
23 (GF2/GF5) 23 (-GF2-GF5)
3
10K
1.5K
1.5K
(UE1)
10V
6
2515 GN/BK
24 24
4
RD
26
2517 BN/WH
26 26
2
GN
19
2516 YE/VT
25 25
1
X370B X370A
X2
5
851 BK/WH
G201

Description and Operation

OnStar Description and Operation

This OnStar® system consists of the following components:

- Telematics Communication Module
- OnStar® three button assembly
- Microphones
- Cellular antenna
- Navigation antenna
- Back up battery
- WiFi Support
- TTY (Teletypewriter)

This system also interfaces with the factory installed vehicle audio system.

Telematics Communication Module

The OnStar Telecommunications Platform (TCP) system communicates with various infotainment components via Ethernet. The OnStar TCP uses Global System for Mobile Communication (GSM) to communicate data and voice signals over the national cellular network. The Telematics Communication Module supports entertainment WiFi hotspots by providing a connection to the cellular network for internet access. The module is capable of up to 4G LTE speeds and houses two technology systems, one to process Global Positioning System (GPS) data, and another for cellular information. The module sends and receives all cellular communications over two cellular antennas and cellular antenna coax cables.

The OnStar TCP system has two antenna inputs, a primary cellular signal and a combined GPS/secondary cellular signal. OnStar can receive signals from multiple global navigation satellite systems, including the United States developed GPS and Russian developed Global Navigation Satellite System (GLONASS).

The module also has the capability of activating certain features such as, the horn, remote engine starting, initiating door lock/unlock, or activating the exterior lamps using the serial data circuits. These functions can be commanded by the OnStar® Call Center per a customer request or mobile device app depending on vehicle and customer subscription.

Dedicated circuits are used to connect the Telematics Communication Module to a microphone, the button assembly, and radio. When equipped, the Telematics Communication Module may contain a back up battery (BUB) which is internal to the control module and replaceable through an access cover. The Telematics Communication Module communicates with the rest of the vehicle over the serial data bus and Ethernet. Power is provided by a dedicated, fused B+ circuit. Ground is provided through the vehicle wiring harness attached to the module. The power mode state is determined by the Telematics Communication Module through serial data messaging.

For China Only Battery Electric Vehicles- The Vehicle Data Monitor module collects vehicle and electrification state of health messages and sends this data to the Telematics Communication Module. The TCM is then responsible for sending the data to a SGM/government server via the 4G network.

OnStar® Three Button Assembly

- The OnStar® button assembly may be part of the rearview mirror, or a separate, stand alone unit. The button assembly is comprised of 3 buttons or 3 capacitive touch buttons and status LED’s or an error indicator. The buttons are defined as follows:
  - The answer/end button, which is black with a white phone icon or a white driver figure seated with voice signals near its face, allows the user to answer and end calls or initiate speech recognition.
  - The blue OnStar® call center button, which displays the OnStar® logo, allows the user to connect to the OnStar® call center.
  - The emergency button, which displays white letters “SOS” with red background, sends a high priority emergency call to the OnStar® call center when pressed.

If the LED does not illuminate, this may indicate that the customers OnStar® subscription is not active or has expired. Push the blue OnStar button to connect to an advisor who can then verify the account status.

The Telematics Communication Module supplies 10 volts to the OnStar® button assembly on the keypad supply voltage circuit. When pressed, each button completes a circuit across a resistor allowing a specific voltage to be returned to the Telematics Communication Module on the keypad signal circuit. Depending upon the voltage range returned the Telematics Communication Module is able to identify which button has been pressed.

The OnStar® status LED or error indicator is located near the buttons. The LED is green when the system is ON and operating normally. When any indicator is illuminated and flashing, it is an indication that a call is in progress. When the LED is red, this indicates a system malfunction is present. In the event there is a system malfunction and the OnStar® system is still able to make a call, the LED will flash red during the call.

Each LED or error indicator is controlled by either the Telematics Communication Module over dedicated LED signal circuits or by low speed GM LAN serial data depending on the inside rearview mirror option. Ground for the LED is provided by the wiring harness attached to the button assembly.

Secondary OnStar® Controls

Some vehicles may have an additional button that when pushed can engage the OnStar® system. The button may be a symbol of a face with sound waves, or may say MUTE, or be a symbol of a radio speaker with a slash through it.

By engaging the OnStar® system with this feature, the user can interact with the system by use of voice commands. A complete list of these commands is supplied in the information provided to the customer. If the information is not available for reference, at any command prompt the user can say "HELP" and the Telematics Communication Module will return an audible list of available commands.

Microphones

This system utilizes two hands free audio microphones, the primary microphone on the driver side and a secondary/reference microphone for the front passenger side. The primary microphone is connected directly to the Telematics Communication Module. It is also connected by an analog pass-through circuit to the radio from the Telematics Communication Module. The secondary microphone is connected directly to the radio.

The primary microphone is used for emergency and OnStar calls. During normal operating conditions it also provides Bluetooth calls and speech recognition to the radio. The secondary microphone is used as a reference for the primary microphone for passenger interference cancellation during speech recognition and also to enhance the driver side hands free calls. For MY18 and beyond the secondary microphone can also be used for front passenger hands free phone calls.

The front passenger secondary microphone is never used as a direct source for an OnStar call. The second microphone input modifies the primary microphone input to reduce background noise and other interference. An OnStar call requires the microphone to be directly connected to the Telematics Communication Module. During a normal (non-emergency) OnStar call the Telematics Communication Module receives an audio signal from the primary microphone and sends the signal to the radio via the Ethernet connection. The radio processes the OnStar call audio and sends it back to the Telematics Communication Module via the Ethernet connection. During an emergency button call the Telematics Communication Module contacts the OnStar call center directly and does not send the signal to the radio.

Cellular and GPS Antennas

The combination antenna will have any of the following antenna elements when equipped with OnStar:

- Primary cellular element
- Secondary cellular element
- GPS element
- Digital radio element
- AM/FM element

The OnStar® TCP system uses two cellular antenna elements to send and receive cellular data, the primary cellular element and the secondary cellular element. The primary cellular signal is carried by a coax cable that connects the antenna directly to the Telematics Communication Module. Details of the secondary cellular signal are further described below.

The GPS antenna element is used to collect the signals of the orbiting GPS satellites. GPS signals are output from the Telematics Communication Module on Ethernet. Other modules on Ethernet may use the GPS latitude, longitude and satellite time data broadcast by the Telematics Communication Module. Using positioning information from the vehicle Ethernet avoids the use of a coaxial signal splitter to pass the analog GPS signal to other modules. Within the antenna is housed a low noise amplifier that allows for a more broad and precise reception of this data. Also housed within the antenna is circuitry to combine the GPS signal and the secondary cellular signal. The combination GPS/secondary cellular signal is carried by a coax cable that connects directly to the Telematics Communication Module. The cable also provides a path for DC current for powering the antenna.

Compass Heading

The Telematics Communication Module has a compass feature to calculate vehicle direction which is displayed via the instrument panel cluster or designated display. The compass heading is determined by dead reckoning until the GPS 3D fix is established. The dead reckoning is accomplished by using the yaw rate sensors and wheel ticks to determine heading changes from a GPS known heading. The GPS 3D fix heading is determined by the deferential of two locations.

Bluetooth®

With the OnStar TCP system Bluetooth® resides in the radio. Refer to Radio/Audio System Description and Operation for further details.

Phantom Phone Calls

A customer may report that the OnStar® system is attempting and/or completing phone calls which the operator of the vehicle did not initiate.

It is important to know which type of reported phantom phone call the operator is reporting. Some phone calls of this nature are considered normal and cannot be addressed other than through education, while others may require some remedial action to resolve. When attempting resolve, it is very important to determine under which circumstances the reported Phantom Phone call resulted.

The following are different scenarios:

- The vehicle may receive an incoming call just like any other phone. Typically the customer will hear the phone ringing in the vehicle. This scenario also includes incoming Bluetooth calls.
- Because the button assembly and associated wiring feeds voltage back to the OnStar® system based on the amount of voltage drop through each of the buttons, should the return line be partially shorted to voltage the system could interpret this voltage as a key press. If one of the buttons voltage is simulated, such as the Blue button. The system will make a phone call just as if the button had been pressed by the operator of the vehicle. Refer to the OnStar Button Malfunction document for diagnostics.
- Internal module fault. Some customers may report a condition where ″Phone Unavailable″ message is heard after the vehicle door is opened or key is cycled. The technician may find a DTC stored in the Telematics module (example: U1500 or B1000). Refer to diagnostics for the DTC making sure to follow any applicable Bulletins or PIs.
- Unwanted Hands free calling activation. A customer may report that the ″Ready!″ or ″OnStar® Ready!″ message is heard while driving. The customer may also advise that this seems to happen mostly while making a turn. In some cases it has been found that the customer is inadvertently pressing the ″push to talk″ button on the steering wheel controls. On rare occasions, other issues in the steering column or Steering Wheel Control system may induce this event.

The majority of reported Phantom Phone Calls can be attributed to accidental button presses or customer induced concern. In some cases an incoming call may be mistaken as a phantom call concern. It is important to verify all aspects of the customer concern in order to properly duplicate and diagnose the condition. If the concern points to normal operation and customer induced concern, please communicate to the customer this condition is a normal operating characteristic of their vehicle.

Back-up Battery

In some vehicles, the OnStar system is equipped with a Back-Up Battery (BUB) installed inside the Telematics Communication Module . This battery is a two-cell lithium-ion rechargeable battery assembly, connected with a short electrical harness, to the circuit board in the module. Contained within this two-cell battery package are a temperature-sensing thermistor, automatic-resetting circuit-overload protection, and a low-pressure vent valve. Nominal voltage of the battery pack is 7.3 Volts.

The BUB is only switched into service when the OnStar system is in normal On condition, vehicle power mode of either Run or On, and main vehicle battery power (B+) at the Telematics Communication Module suddenly becomes near-zero. At this time BUB power is connected to the main circuit board power using solid-state power switching circuits. After initiating BUB for module power, the CAN bus is monitored for a message confirming a collision-event, or near-collision event, has occurred. If a confirmation message is received, the Telematics Communication Module continues to use BUB as the power supply until it is depleted. If a confirmation message is not received within 10 seconds, the BUB power circuits are internally disconnected, preventing inadvertent discharge of the battery.

Charging circuitry within the Telematics Communication Module maintains the state of charge of the BUB. BUB charging occurs as determined by the module software, primarily based on temperature and state of charge. Battery state of charge is measured by the Telematics Communication Module circuitry, and remaining energy capacity calculated by the module software. On-board diagnostic tests check for circuit faults, over-temperature conditions, and low-energy capacity. Current DTCs will set for each of these conditions. No component checks are required, and are not recommended, for BUB diagnosis.

WiFi Support

The Telematics Communication Module supports entertainment WiFi hotspots by providing a connection to the cellular network for internet access. The radio acts as the central WiFi router and connects hardwire Ethernet to the Telematics Communication Module. The Telematics Communication Module completes the connection to the internet through the cellular network. It has the ability to connect up to 7 devices at one time.

Audio System Interface

When OnStar® requires audio output, a serial data message is sent to the audio system to mute all radio functions and transmit OnStar® originated audio. The OnStar® audio is transmitted to the vehicle audio system by Ethernet and circuitry .

The audio system will mute and an audible ring will be heard though the speakers if the vehicle receives a call with the radio ON.

On some vehicles, the HVAC blower speed may be reduced when the OnStar® system is active to aid in reducing interior noise. When the system is no longer active, the blower speed will return to its previous setting.

OnStar® Sleep Cycle

The OnStar® system uses a unique sleep cycle to allow the system to receive cellular calls while the ignition is in the OFF position and retained accessory power mode has ended. This cycle enables the Telematics Communication Module to perform remote functions, such as door unlock, as commanded over the air by the OnStar® Call Center, and to continue to maintain an acceptable level of battery electrical drain.

The OnStar® system uses 4 states of readiness, depending upon the type of cellular market the vehicle is in when the ignition is put into the OFF state:

- High power
- Low power
- Sleep
- Digital standby

The high power state is in effect whenever the ignition is in the ON or RUN position, or retained accessory power is enabled, and the OnStar® system is sending or receiving calls or when the system is performing a remote function.

The low power state is in effect when the OnStar® system is idle with the ignition in the ON or RUN position, or with retained accessory power enabled.

The digital standby power state is entered after the vehicle has been shut off and the retained accessory power has timed out while in a digital cellular area. When in digital standby mode, the OnStar® module is able to perform all remote functions as commanded by an OnStar® advisor at any time, for a continuous 120 hours. After 120 hours, the Telematics Communication Module will go into sleep mode until a wake up signal from the vehicle is seen by the Telematics Communication Module. If the Telematics Communication Module loses the digital cellular signal it will revert to analog mode and follow the standard sleep state (9 minutes OFF, 1 minute standby) based on the time of the GPS signals, this will continue until a digital cellular signal is again received.

If the OnStar® system loses battery power while the system is in a standby or sleep mode, the system will remain OFF until battery power is restored and the ignition is turned to the ON or RUN position.

Features

Turn by Turn Navigation (if equipped)

Turn by Turn Navigation allows the driver to contact OnStar® to obtain directions for driving from a current location to a desired location. The Turn by Turn Navigation system stores your planned route and continually checks your position along that route. When you deviate from the planned route, the system will recognize this and prompt the driver with verbal prompts for how to proceed.

Teletypewriter (TTY) Users

OnStar has the ability to communicate to deaf, hard-of-hearing, or speech-impaired customers while in the vehicle. The available dealer-installed TTY system can provide in-vehicle access to all of the OnStar services, except Virtual Advisor and OnStar Turn-by-Turn Navigation.

Deactivated OnStar® Accounts

In the event a customer has not renewed their OnStar® account after expiration or the account was never activated, OnStar® will make a discrete cellular call to the vehicle to deactivate the OnStar® system. Before taking this action, customers are notified that the OnStar® system in their vehicle will be deactivated unless they elect to renew the account. After the OnStar® account has been deactivated, customers will experience the following:

- The OnStar® status LED will not illuminate.
- The OnStar® system will NOT attempt to connect to the OnStar® Call Center in the event of a collision or if the vehicle's front air bags deploy for any other reason.
- An emergency button press will play a demo message indicating the service has been deactivated.
- An OnStar® Call Center button press will connect the customer with a dedicated sales team who can sell an OnStar® subscription and reactivate the vehicle. Depending on the type of OnStar® hardware in the vehicle, the customer may first hear a demonstration message stating there is no current OnStar® subscription for the vehicle, and directing the customer what to do to activate services.
- OnStar® personal calling will not be available, as this feature requires the customer to have a current OnStar® account. Attempts to use this feature may result in cellular connection failure messages and the inability to connect to the number dialed.

Certain vehicles that have never had an active OnStar® account, or that have been deactivated, may be unable to establish a connection with the OnStar® Call Center. When normal published diagnostic procedures do not indicate a possible cause for the no connect concern, the vehicle may have been deactivated. For deactivated vehicles, a no connect response should be considered normal operation. Further diagnosis and subsequent repair is only necessary should the customer elect to become an active OnStar® subscriber or renew the account subscription.

OnStar® Cellular, GPS, and Diagnostic Limitations

The proper operation of the OnStar® System is dependent on several elements outside the components integrated into the vehicle. These include the National Cellular Network Infrastructure, the cellular telephone carriers within the network, and the GPS.

The cellular operation of the OnStar® system may be inhibited by factors such as the users range from an analog or digital cellular tower, the state of the cellular carrier’s equipment, and the location where the call is placed. Making an OnStar® key press in areas that lack sufficient cellular coverage or have a temporary equipment failure will result in either the inability of a call to complete with a data transfer or the complete inability to connect to the OnStar® Call Center. The OnStar® system may also experience connection issues if the identification numbers for the module, station identification number, electronic serial number or manufacturers electronic ID, are not recognized by the cellular carriers local signal receiving towers.

The satellites that orbit Earth providing the OnStar system with GPS data have almost no failures associated with them. In the event of a no GPS concern, the failure will likely lie with the inability of the system to gain GPS signals because of its location, i.e. in a parking structure, hardware failure, or being mistaken with an OnStar® call which has reached the Call Center without vehicle data.

During diagnostic testing of the OnStar® system, the technician should ensure the vehicle is located in an area that has a clear unobstructed view of the open sky, and preferably, an area where analog or digital cellular calls have been successfully placed. These areas can be found by successfully making an OnStar® keypress in a known good OnStar® equipped vehicle and confirming success with the OnStar® Call Center advisor. Such places can be used as a permanent reference for future OnStar® testing.

Mobile Identification Number and Mobile Directory Number

The Telematics Communication Module utilizes two numbers for cellular device identification, call routing and connection, a mobile identification number and a mobile directory number. The mobile identification number represents the number used by the cellular carrier for call routing purposes while the mobile directory number represents the number dialed to reach the cellular device.

Radio/Audio System Description and Operation

The entertainment system on this vehicle may have several different configurations available to it. To determine the specific configuration of the vehicle, please see the Service Parts ID Label, and refer to *RPO Code List 0-2*.

Each item in the list below represents topics covered in detail below.

- Demo Mode
- Data Communications

- Remote Radio Receiver
- Speaker Operation
- Antenna System
- Radio Reception
- Active Noise Cancellation/Auto Volume Control (If equipped)
- Microphones
- Bluetooth ® (if equipped)
- WiFi
- Back Office Registration
- Applications (if equipped)
- Speech Recognition
- Navigation System Components and Features (if equipped)
- Locations Services
- Valet Mode
- Teen Driver
- Passenger Mode
- Theft Deterrent
- Audio Amplifier (if equipped)
- Infotainment Controls and Display
- Steering Wheel Controls (If equipped)
- SD Card Reader, USB and Auxiliary port
- OnStar ®
- OTA (Over The Air) Programming
- GAS (Google Automotive Services) if equipped
- Compass Data
- Media Disc Player (if equipped)
- Digital Rearview Camera (if equipped)

Demo Mode

The radio on new unsold vehicles received at the dealer will be in Demo Mode. In Demo Mode a phone will only stay paired for the current key cycle and lose pairing to the radio after the vehicle shuts down and restarted after 10 min. Additional operational characteristics of Demo Mode include no retention of the following:

- Stored favorites
- Last station tuned
- Bluetooth synced devices
- Volume level
- Last app or screen view
- Audio/equalizer settings

Note: If a device was originally paired while in Demo Mode, a similar condition could occur that randomly continues to drop Bluetooth pairing after exiting Demo Mode. If the vehicle is not in Demo Mode, but it is believed the device was originally paired while in Demo Mode, then delete the device from the radio, delete the radio from the device, and perform the pairing process again.

Loss of functionality on the above items may be due to the design intent of the vehicle while in Demo Mode, no correction is needed for these conditions. This is the normal operating characteristic of the Demo Mode of the vehicle. Once the vehicle is sold, select the option labeled “Not a Demo Vehicle” to exit Demo Mode.

Data Communications

The infotainment system communicates with other devices on multiple serial data networks during operation.

Ethernet AVB

At the core of the infotainment system is the Radio Ethernet AVB (Audio Video Bridging) switch, which communicates directly to each contributing Infotainment module terminator. The Ethernet harness consists of twisted pair wires from point to point. Each module on the Ethernet infotainment system sends/receives data at 100 megabit per second (Mbps) to/from a specified port at the Radio. Some system configurations support a 1 Gigabit per second (Gbps) connection at the Radio to/from the TCP (Telematics) module. The Radio/Ethernet will also be used to program USB software update files to the modules connected to the Ethernet ports. Some of the data services performed over Ethernet AVB include: Chime, Service Programming via Over-The-Air updates, OnStar Turn-by-Turn directions and all other OnStar data services.

Local Interconnect Network (LIN)

The Local Interconnect Network (LIN) Bus is a single wire communication system. This bus is used to exchange information between a master control module and other smart devices which provide supporting functionality.

The Remote Radio Receiver, Information Display, Infotainment Controls and the Multifunction (tunnel) Controls all communicate on the LIN bus.

Controller Area Network (CAN)

The Radio will communicate with other modules and systems in the vehicle via CAN and CAN5. Diagnostic Trouble Codes will be read on CAN/CAN5 to diagnose Ethernet, LIN and system faults. CAN will also be used for programming calibrations using Tech Line Connect (TLC)/SPS. CAN takes the place of GMLAN on Global-B architecture systems. CAN5 is a sub-system of the entire CAN network on a vehicle and is the specific network that connects the Infotainment modules on the vehicle.

For additional information refer to Data Link Communications Description and Operation 8-26

Automotive Audio Bus (A2B)
The Automotive Audio Bus (A2B) uses a radio and one or more amplifiers. It is a private, digital, and high speed serial bus. The system contains a master (radio) and one or more slaves (amplifiers) connected by an unshielded twisted pair (UTP) wiring harness. Diagnostic Trouble Codes (DTCs) are set within the master node for all errors in the system, if the bus is up and communicating. The system operates on full duplex, where communication is possible over a single wire if the other wire is damaged or open. The network is daisy chained. A and B ports are isolated by the A2B transceiver. The A2B bus line doesn’t require any terminator. The last device is configured as end node by the A2B master processor during the network discovery process.

Remote Radio Receiver

Overview

The Radio is the Ethernet master. The radio also communicates with other components and systems within the vehicle via CAN/CAN5 and LIN. The remote radio receiver communicates with the info display module via the LIN bus for control information, touch communications and dimming level. Digital video data is sent to the display through a dedicated video cable.

The Radio receiver contains internal antennas for Bluetooth ® and WiFi. The Radio also has an external WiFi antenna (on applicable systems) that is used to receive local WiFi signals at increased distances. This is mainly used to support Over-the-Air updates. The Radio must be mounted properly to obtain proper wireless signals and GPS position. The remote radio receiver is responsible for receiving all broadcast audio bands. Broadcast signals from AM, FM, XM and DAB bands are transmitted to the radio via the vehicle antenna systems. The remote radio receiver is also responsible for the following: Video for the infotainment display, Bluetooth ®, USB, memory card reader, and speech recognition functions.

The Radio has phone projection capabilities that can transmit information directly to the vehicle infotainment system through Bluetooth or a USB connection. Downloadable applications will be available based on distracted driver safety requirements.

Radio Power
The radio receives battery power and ground from the vehicle harness.

The radio does not use a discrete ignition feed circuit for power moding. The power mode master provides the system power mode to the radio via serial data messages. The power mode master determines the system power mode by processing power mode information from ignition switch inputs. Serial data power modes supported by the radio are OFF, ACCESSORY, RUN, and CRANK REQUEST.

The radio can be turned ON with the ignition OFF. After 10 minutes of inactivity the radio will power down. If any setting (e.g. changing the station) or volume has been changed or if the radio has been powered OFF than back ON the 10 minute timer will reset from that point.

Radio Audio Outputs
When not equipped with an amplifier, the radio outputs all audio signals to the speakers via the vehicle wiring harness.

When equipped with an amplifier, the radio outputs all audio signals digitally over Ethernet.

Speaker Operation

Speakers turn electrical energy into mechanical energy to move air, using a permanent magnet and an electromagnet. The electromagnet is energized when the radio or amplifier (if equipped) delivers current to the voice coil on the speaker. The voice coil will form a north and south pole that will cause the voice coil and the speaker cone to move in relation to the permanent magnet. The current delivered to the speaker is rapidly changing alternating current (A/C). This causes the speaker cone to move in two directions producing sound.

Antenna System

Multi-Band Antenna

The multi-band antenna is located on the roof of the vehicle. This type of antenna may be used with the AM/FM radio, but is primarily for cellular, GPS signals, and XM, if the vehicle has these features. Keep this antenna clear of snow and ice for clear reception. If the vehicle has a sunroof, the performance of the system may be affected if the sunroof is open. Loading items onto the roof of the vehicle can interfere with the performance of the system. Ensure the multi-band antenna is not obstructed.

Diversity Antenna

The diversity antenna system can use up to two antenna amplifiers and an AM/FM element that is part of the rear end spoiler assembly or applied as appliqués to the rear glass. With two antennas the right antenna 1 receives both AM and FM signals, while the left antenna 2 may receive FM and Digital Audio Broadcast (DAB) signals only. The antenna amplifier receives the signals from the rear end spoiler antenna element or from the glass antenna element. Each antenna amplifier is connected to the radio by a coaxial cable.

The radio antenna amplifier is enabled when the radio is turned on. The radio provides battery voltage to the antenna amplifier using the center conductor of the antenna coaxial cable. When a 12 V signal is seen by the amplifier on the center conductor of the antenna coax, the received signals are amplified.

With a two antenna amplifier system when the AM band is selected on the radio, the antenna 1 amplifier connects the AM antenna to the radio. When the FM band is selected, both antenna amplifiers provide FM signals to the radio. The radio switches between the two FM antennas, monitoring the signal strength and combines the signals to create one stronger signal.

Global Positioning System (GPS) Antenna

The global positioning system (GPS) antenna is part of the multi-band antenna located on the roof of the vehicle. The GPS antenna is used to collect the signals of the orbiting GPS satellites. Within the antenna is housed a low noise amplifier that allows for a more broad and precise reception of this data. The GPS antenna amplifier is powered through the coaxial cable.

The GPS antenna is connected to the telematics communication interface control module via a coax cable. The GPS signal is sent to the navigation radio via an Ethernet harness.

External WiFi Antenna

On some system configurations, an external WiFi antenna is connected to the radio to support longer range reception, compared to the internal Wifi antenna. Over-the-air updates is the main feature supported by this antenna. Data transfers used for consumer media will also be supported by this antenna when connected to a local network. The antenna is connected to the radio via coaxial cable.

Radio Reception

AM/FM Radio Signal

The radio signal is sent from a broadcast station and is then received by an antenna. The strength of the signal received depends on the following:

- The power output (wattage) of the broadcasting station
- The location of the vehicle (or receiver) relative to the broadcast tower.
- Height of the broadcast antenna
- Height of the receiving antenna
- Obstacles between the tower and the receiver
- Atmospheric conditions
- What band (AM or FM) the station is broadcasting
- Type of antenna and the ground plane

Sirius XM (SXM) Digital Radio Receiver (If equipped)

A service fee is required in order to receive the XM service.

The XM satellite receiver is integrated into the radio. XM satellite radio provides digital radio reception. The XM signal is broadcast from two satellites and, where necessary, terrestrial repeaters. The high power satellites allow the antenna to receive the XM signal even when foliage and other partial obstructions block the antennas view of the satellite. Terrestrial repeaters are used in dense urban areas. These repeaters will receive the satellite signal and re-broadcast them at much higher power levels in order to ensure reception in areas with densely packed tall buildings. Even with repeaters the signal can be compromised resulting in loss of XM.

SiriusXM 360L

SiriusXM with 360L interface has enhanced in-vehicle listening experience for subscribers. The experience now offers more categories and system learned recommendations toward discovering more personalized content.

To use the full SiriusXM 360L program, including streaming content and listening recommendations, OnStar Connected Access is required. Connected vehicle services vary by model and require a complete working electrical system, cell reception, and GPS signal. An active OnStar connected plan is required, if the customer declines OnStar Terms and Conditions the following message can be displayed: Connection Unavailable, Please call OnStar Agent.

Reference the SiriusXM user guide for use and subscription information.

SiriusXM Tune Start

SiriusXM Tune Start is a feature that begins playing the current song from the beginning when you tune to a SiriusXM music channel in the stored Favorites. This feature can be enabled/disabled through the radio Settings menu.

When equipped, Tune Start works with most SiriusXM music channels when the channel has been saved as a Favorite in the radio. The SiriusXM app in the radio also has a list of Favorites. Saving a SiriusXM music channel as a Favorite automatically saves it in the hidden SiriusXM Favorites list. If a SiriusXM music channel is not working in Tune Start ensure the channel exists in the SiriusXM Favorites list. SiriusXM Favorites can be found in the SiriusXM Settings menu under Listener Options. Note that SiriusXM channels stored by default in new vehicles are not stored in the SiriusXM Favorites list. These channels would need to be stored as Favorites by the user for them to appear in the SiriusXM Favorites list. The radio may require a sleep cycle before Tune Start will begin to function on newly saved Favorites. Tune Start will only begin to record SiriusXM Favorites with the Ignition On, so some buffering time is required before Tune Start can function after the vehicle is started.

Tune Start is a SiriusXM feature. Reference the SiriusXM user guide, or contact SiriusXM for use and subscription information.

High Definition (HD) Radio (If equipped)
HD Radio delivers subscription free local broadcasting in a digital format which may include song title, artist name, album art, weather, traffic data, etc., on AM/FM bands. Up to four stations could be available on a single frequency for e.g. if radio station is 96.9 FM, the HD enabled radio would have additional broadcasts on 96.9 HD1, HD2, HD3 and HD4. The digital technology allows for clear reception quality and additional information.

Active Noise Cancellation/Auto Volume Control (If equipped)

Active Noise Cancellation (or sometimes referred to as Auto Volume Control) may have several different configurations. To determine the specific configuration of the vehicle, please see the Service Parts ID Label, and refer to *RPO Code List 0-2*.

The main components of the Active Noise Cancellation system are:

- Microphones in the vehicle headliner. Use schematics to determine the number of microphones in each vehicle.
- An engine speed (RPM) signal from the engine control module to the amplifier/active noise cancellation module/radio.
- Active Noise Cancellation electronics and software integrated into the audio amplifier/active noise cancellation module/radio.
- The vehicle speaker system, connected to the amplifier/active noise cancellation module/radio, to output the desired cancellation frequencies.

The Active Noise Cancellation system is operational under the following conditions:

- The amplifier/active noise cancellation module/radio has passed all self diagnostic checks.
- All doors are closed.
- Battery voltage is between 9.5 V and 16 V.
- The vehicle cabin temperature is less than 140°F (60°C).
- For internal combustion engines- Engine speed is between 550 and 3000 RPM

The Active Noise Cancellation/Auto Volume Control system is a method used to reduce the perception of certain undesirable sounds generated by the engine into the vehicle cabin. The systems uses microphone and engine speed signals, software integrated into the amplifier/active noise cancellation module/radio, and the vehicle speakers to determine and generate the correct frequencies needed to achieve the desired reduction.

The microphones are located in the headliner to monitor noise/sounds in the vehicle cabin, and are directly connected to the amplifier/active noise cancellation module/radio. For internal combustion engines the amplifier/active noise cancellation module/radio also receives an engine speed (RPM) signal from the engine control module. The amplifier/active noise cancellation module/radio processes these inputs to determine the frequency of the undesirable sound. The amplifier/active noise cancellation module/radio then calculates the appropriate cancellation frequency and outputs a cancellation signal (audio tone) to the vehicle speakers to reduce the perception of undesirable sounds by the vehicle occupants so the vehicle cabin appears quieter and without vibration.

Microphones

This system utilizes two hands free audio microphones, the primary microphone on the driver side and a secondary/reference microphone for the front passenger side. The primary microphone is connected directly to the Telematics Control Module. It is also connected by an analog pass-through circuit to the radio from the Telematics Control Module. Without OnStar the primary microphone is connected directly to the radio. The secondary microphone is always connected directly to the radio.

The primary microphone is used for emergency and OnStar calls. During normal operating conditions it also provides Bluetooth calls and speech recognition to the radio. The secondary microphone is used as a reference for the primary microphone for Barge-in and Passenger Interference Cancellation during speech recognition and also to enhance the driver side hands free calls. For MY18 and beyond the secondary microphone can also be used for front passenger hands free phone calls. Barge-in allows a user to speak over the system prompts. Passenger Interference Cancellation ignores unwanted inputs from cabin noise that is not related to the prompts given by the user.

The front passenger secondary microphone is never used as a direct source for an OnStar call. The second microphone input modifies the primary microphone input to reduce background noise and other interference. An OnStar call requires the microphone to be directly connected to the Telematics Control Module. During a normal (non-emergency) OnStar call the Telematics Control Module receives an audio signal from the primary microphone and sends the signal to the radio via the Ethernet connection. The radio processes the OnStar call audio and sends it back to the Telematics Control Module via the Ethernet connection. During an emergency button call the Telematics Control Module contacts the OnStar call center directly and does not send the signal to the radio.

Bluetooth ® (If equipped)

Bluetooth ® wireless technology is a short-range communications technology intended to replace the cables connecting portable and/or fixed devices while maintaining high levels of security. The operating range of the signal is approximately 30 feet.

The available features and functions are determined by the type of device and the software within the devices being used. For a feature or function to operate, it must be supported in both devices.

The first connection between devices is established through a process called pairing. In order to pair two devices, a password (passkey) has to be exchanged between the two devices. One device will generate the password, the other device accepts the password to complete the process. Once the devices are paired, future connections between the devices will occur automatically when the devices are on and within range of each other.

The Bluetooth ® hardware is internal to the Remote Radio Receiver. The antenna is internal to the Remote Radio Receiver. The Remote Radio Receiver supports streaming of data (music, voice, information) from cellular phones and other mobile devices that support those features. The Remote Radio Receiver is also capable of interfacing with cellular phones for hands-free features.

- The device must be paired to the system to use the available Bluetooth ® feature(s). The pairing process must only be performed once for each device, unless that device's information is deleted.
- Depending on model year up to 10 devices can be paired, refer to owners manual for details.
- Streaming Audio allows playing music from the mobile device wirelessly. Music stored on the mobile device can be viewed and controlled from the display.
- To stream audio from a mobile device, the device must be unlocked, and any additional applications should be closed.

Refer to the owners manual, supplements, and the device manufacturers information for pairing instructions.

WiFi

The WiFi hardware is internal to the Remote Radio Receiver. The WiFi or WLAN antenna is called the Wireless Communication Antenna which is connected to the Remote Radio Receiver. WiFi expands the abilities of the vehicle as described below:

- Connect to home WiFi to update software.
- When used with OnStar 4G LTE HotSpot service, it provides internet access to devices in the vehicle when connected to the HotSpot. This requires the purchase of OnStar WiFi data plan.
- Enables in-vehicle networking between passengers' devices, like home WiFi network.
- Allows remote access to external connected device application data for vehicle internet application use.

Back Office Registration

The Radio must be registered with the GM Back Office in order to receive downloaded information such as approved applications, module software updates, weather and traffic information for current location. The vehicle must have a Cellular or WiFi connection to complete the initial registration process. This process will verify the assembly plant factory feed data from the BCM, CGM and Radio serial numbers to the VIN and if the security checks are met, then the user must complete the registration process by entering email and required personal information. The registration status can be verified through the Radio "Setting – About" selection.

When any of these secured ECU's are replaced, a new serial number will be recorded during the service calibration process and appended to the vehicles history data for uninterrupted back office connection.

If the Radio is replaced, the user can recover settings/ applications by reregistering the email account. During the initial registration process the user will enter an email/password. The user will then be sent a follow up verification email link to setup the account completely. If the complete account setup is not performed the password reset security questions will not be entered, which will prevent reregistering this email account in the future if the password is forgotten. The radio will operate in Demo Mode or as Guest until a user profile has been set up.

Applications (If equipped)

Note: For vehicles equipped with Google Automotive Services (GAS) refer to that section below.

When the system is equipped with Bluetooth ® or WiFI, the system is capable of using applications, commonly referred to as apps.

The term application refers to any piece of software that works on a system (hardware) that is being operated by it's own software. Applications are typically small software programs which uses the hardware to perform a specific task, as opposed to operating the entire system.

- For an application to be used, it must be installed on both the vehicle infotainment system and a compatible mobile device.
- The device must be connected to the system. this may be done wirelessly via Bluetooth ®, WiFi, or via the vehicle USB port. Refer to the device manufacturers information for the proper connection method.
- When the device is connected, the vehicle infotainment system is used to remotely access and control the application on the mobile device.
- The application must work correctly on the device to work with the vehicle infotainment system.
- The user may be required to log-in to the application on the mobile device before using the application from the vehicle controls.
- Using applications will use the device's data plan.
- The device must be unlocked, and any additional applications should be closed.

Refer to the owners manual and supplements for information on mobile devices, control, and operation.

Speech Recognition

The Speech Recognition feature is implemented only in a Mid/High System Radio module. There is no Speech Recognition in a Low System. Speech Recognition allows the user to command various features of the radio via voice commands. For addition information refer to the owners manual. For model year 2018 (and forward) Mid/High systems, part of the speech recognition functionality is controlled via off-board cloud connection. A speech icon in the radio allows user to see if an utterance has been received by the off-board cloud. Points-of-interest (POIs) data are also stored off-board. Any disruption in the connection to the cloud will cause a partial loss of functionality for these systems.

For model year 2018 (and forward) there will also be a new speech recognition feature called Barge-in. This allows the user to speak over the voice prompts generated by the system. This feature is turned off by default from the factory and must be enabled by the user.

Navigation System Components and Features (if equipped)

There are two different navigation systems- SD card based where the map data is stored on the SD card or through the Google Maps app which is a subscription based service (depending on available options).

The navigation system provides the following:

- A global positioning system (GPS) signal, which provides the vehicle location information.
- Map data for navigation and map route guidance.
- Route guidance with verbal prompts to the operator.
- Traffic and weather information for display on the navigation system map (with active subscription, where available).
- For SD card navigation periodic Map updates can be performed by inserting an updated SD card.

GPS signals are an output from the telematics communication interface control module on Ethernet. Other modules on Ethernet, such as the radio may use the GPS latitude, longitude and satellite time data broadcast by the telematics communication interface control module.

The On-board navigation feature (SD card based) uses an on-board navigation engine with an optimized map display that is calculated and rendered locally.

Route Guidance

The map will display the route to the selected destination. Voice prompts alert the operator of upcoming events (turns) and arrivals at the destination. The navigation system will automatically recalculate if the route is not followed. The remote radio receiver uses data received from the global positioning system (GPS) satellites, the vehicle speed signal, and serial data information to accurately display the current position of the vehicle.

Points of Interest
The map database provides point of interest information. Points of interests are locations that are frequently visited. Points of interest can be can be displayed on the map or set as a destination. The following are some of the available Points of interests:

- Gas Station
- Restaurant
- College
- Police Station

Locations Services

"Locations Services Off" also referred to as Location Masking, is a feature in select 2019 and beyond Infotainment 3 systems that allows customers to enable or disable location services in their vehicle. This allows customers to control what data is being sent from their vehicle, and has important implications for other connected services.

The default setting is "Locations Services On", however, customers can enable or disable Locations Masking in two ways:

1. Press and hold the white button next to the blue OnStar® button in the overhead console.
2. In the Setting menu, select System>Privacy>Location Services>ON or OFF.

- Look for the white LOCATIONS SERVICES icon in the status bar on the Home Screen, next to the clock and outside temperature in the lower right corner of the screen.
- When Locations Services are On, there will be no circle around the icon.
- When the Locations Services are Off, the icon will be circled in red.

Certain functions that require the vehicle's location may not operate properly when Location Services are Off, including:

- Connected Navigation services, if equipped and active, will not work (the system will operate as a non-connected Navigation system).
- Speech recognition may not offer full functionality.
- OnStar advisors will be unable to provide Turn-by-Turn Navigation services.
- Customers may receive error messages in their myChevrolet, myBuick, myGMC, or myCadillac mobile app when trying to use Vehicle Locate.
- Some features of Smart Driver may be inoperable or not work properly, including the score being replaced by dashes.

Note: Emergency services, such as Automatic Crash Notification and Stolen Vehicle Assistance, are NOT impacted by Location Masking.

Valet Mode (If equipped)

Valet Mode is a customer enabled feature of the infotainment system, found in the settings menu, if equipped. The customer creates and inputs a four digit code using the infotainment controls. Confirming the code and selecting LOCK will lock the infotainment system, steering wheel controls and other vehicle features, dependent on vehicle equipment. The vehicle will remain in valet mode until the same four digit code is re-entered.

In the event that the four digit code is forgotten, it can be reset with the scan tool under BCM.

Teen Driver

The teen driver feature puts the vehicle into a mode that can only be unlocked with a valid PIN. It allows various restrictive features for safer driving. Some of the features include Speed Limiter, Speed Warning, Register Key, Report Card, etc. For additional information refer to owners manual.

In the event that the four digit code is forgotten, it can be reset with the scan tool under BCM.

Passenger Mode

A "Passenger Mode Disable Lockouts Y/N" message may appear on the center display when there is a front seat passenger sensed in the seat. Disabling the driving lockouts allows for the passenger to accomplish some tasks that a driver should not while the vehicle is in motion.

Theft Deterrent

The radio theft deterrent system is intended to disable or limit radio functionality if incorrect vehicle information is received by the radio. The radio disables functionality if the VIN information received by the radio does not match the VIN information that has been learned by the radio. The radio receives this information via serial data. A possible cause of incorrect VIN info could be the radio was originally installed in another vehicle.

The radio has the following theft operating modes as part of the theft deterrent system:

- Normal Mode: The radio has learned a correct VIN sequence and the VIN information received via serial data matches the learned VIN sequence. In this mode the radio has full functionality.
- No VIN Mode: The radio has not received or learned a correct VIN sequence. In this mode the radio has limited functionality.
- Theft Detected Mode: The radio has learned a correct VIN sequence and the VIN information received via serial data does NOT match the learned VIN sequence. In this mode the radio may be disabled or have limited functionality. The radio display will indicate that theft protection is active.

Audio Amplifier (If equipped)

Amplifier Interface

A fused battery voltage circuit provides the main amplifier power. The audio amplifier (when equipped) is a participant on the Ethernet bus. The audio amplifier receives audio signals and control information from the Radio. The Amplifier receives battery power and ground from the vehicle harness.

Amplifier Operation

The purpose of the amplifier is to increase the power of a voltage or current signal. The output signal of an amplifier may consist of the same frequencies as the input signal or it may consist of only a portion of the frequencies as in the case of a subwoofer or midrange speaker. The audio amplifier amplifies the signal and sends it to the appropriate speakers.

Each of the audio output channel circuits (+) and (−), at the audio amplifier have a DC bias voltage that is approximately one half of the battery voltage. When using a DMM, each of the audio output channel circuits will measure approximately 6.5V DC. The audio being played on the system is produced by a varying AC voltage that is centered around the DC bias voltage on the same circuit. The AC voltage is what causes the speaker cone to move and produce sound. Both the DC bias voltage and the AC voltage signals are needed for the audio system to properly produce sound.

The audio amplifier is also responsible for operation of active noise cancellation if equipped. Refer to Active Noise Cancellation Description and Operation for more information.

Infotainment Controls and Display

The infotainment display and controls are a separate component from the radio, combined into an assembly. The assembly contains the control knobs and buttons for all audio and HVAC functions and the information display. The assembly is supplied battery voltage and ground from the vehicle harness.

Control information, touch communications and dimming level for the display are communicated via a Low Speed serial data circuit or LVDS cable to the Radio.

The remote radio receiver sends the display digital video data for on-screen display through a dedicated video cable.

The information display provides a feedback on the touch screen and certain controls.

The controls communicate via a Low Speed serial data circuit or LVDS cable with the remote radio receiver. Messages communicated include the following:

- Wake-up/power state messages
- Diagnostic information
- Button presses/knob rotations
- Commands for the state of indicators
- Back-lighting dimming level

Steering Wheel Controls (If equipped)

Some audio functions are available using the steering wheel controls. The steering wheel controls duplicate the function of the primary controls available on the radio.

For additional information on steering wheel controls, refer to Steering Wheel Controls Description and Operation.

USB Port, SD Card Reader and Auxiliary port (If equipped)

The infotainment system may contain an assembly that has either a USB port, Auxiliary port, and may even have an SD card reader located within the drivers reach. The assembly interfaces with a hub device, internal to the auxiliary jack, USB, and memory card receptacle assembly. The auxiliary jack, USB, and memory card receptacle assembly receives fused battery voltage and ground from the harness to power the internal hub device as well as providing additional amperage to power USB devices.

The internal hub device interfaces directly with the remote radio receiver via a standard USB cable. A Mini type USB connector is used to connect the cable at the USB port and at the remote radio receiver and at the auxiliary jack, USB, and memory card receptacle. Standard USB male to female connections are typically used for connecting USB cables together where an in-line connection is required. An in-line cable connection is typically found between the console and I/P harness.

USB Port

The USB port allows connectivity to the infotainment system from portable media players or a USB storage device (memory stick/ flash drive). When a device is connected to the USB port, the device can be controlled from the radio controls.

Not all portable media player devices or file types are compatible. Connection to USB hub devices is not supported.

To ensure a USB drive is compatible, it should be formatted as either FAT32 or exFAT. FAT32 is widely compatible and recommended for drives 32GB and smaller, while exFAT is better for larger drives.

Formatting will erase all data on the USB drive, so back up any important files before proceeding.

Supported music file types: MP3, OGG, ACC, and 3GP audio file formats.

SD Card Reader (if equipped)

On certain Navigation vehicles the SD card will contain the Map information for the vehicle region. The Map data will be updated either by replacing the SD card with the latest release or in regions that support it, OTA wireless updates via WiFi on MY18> vehicles.

Refer to the owners manual for information on the Navigation system.

Auxiliary Audio Input Jack (if equipped)

The infotainment system may have a 3.5mm (1/8 in.) auxiliary audio input jack located in the center console. The auxiliary audio input jack interfaces directly with the radio. When a portable audio playback device is connected to the auxiliary jack, an internal switch detects the connection and the radio will switch to AUX as the audio source. Audio signals from the device are sent to the radio from the auxiliary jack via USB.

- When a device is first connected to the 3.5mm (1/8 in.) input jack the infotainment system automatically switches to that device. If an auxiliary device has already been connected, press the AUX or CD/AUX button to select the device.
- Playback of an audio device that is connected to the 3.5mm jack can only be controlled using the controls on the device.
- The volume control on the device may need to be adjusted eo ensure sufficient playback volume through the infotainment system.

OnStar ® (If equipped)

When OnStar is activated, a serial data message is sent to the radio that activates default audio settings. The fade will be set to the front, Bass and Treble are set to the mid range, the outputs are mono, when the audio source is OnStar. OnStar takes priority over any other audio source.

For additional OnStar information, refer to OnStar Description and Operation.

Over The Air Programming

The Over The Air Programming feature was designed to reflash software remotely. Remote reflash is an in-vehicle feature that enables the installation of a software package to update the infotainment system without requiring service test equipment to be physically connected to the vehicle. Remote reflash will utilize a long range or short range connection from the host module to a remote IT system. There must be an active OnStar account to receive Over The Air programming or updates. To verify the status of the account perform a blue button press and verify the account is active and connects with data and location. Customers need to accept the OnStar terms and conditions, and must have an active OnStar account to receive any Over The Air programming or updates.

Note: A data plan is not required to receive Over The Air programming or updates. Also the programming or updates do not consume a customers available data.

Note: Fleet vehicles must be activated as a Fleet account (not a business account) and require a separate Terms and Conditions agreement to be completed. Please see your fleet administrator for assistance with completing this agreement.

GAS (Google Assistant Services) if equipped

Some of the GAS features are:

- Maps – Benchmark maps, navigation, traffic and point of interest data and legal speed limit sign information.
- Assistant – Voice assistant cloud services with vehicle integration (e.g., radio, HVAC).
- Play Store – Access to favorite media streaming apps plus first party GM apps.
- Keyguard – similar to a code to unlock your cell phone. When this feature is enabled a customer created lock (pattern, PIN or password) will need to be entered to unlock the radio at every ignition cycle. When the radio is locked SPS diagnostics will be unavailable. To utilize SPS diagnostics when the radio is locked enter the “Guest Mode” feature.

A connectivity package needs to be purchased to have the full experience. Refer to the Owner Manual for further information on Google Automotive Services.

Compass Data

With the Base Radio the Telematics Control module provides compass and GPS position information on the Info-CAN bus when it is present.

In a Mid / High Radio System configuration without a Telematics Control Module and equipped with GPS, the radio shall provide the GPS and heading information on Info-CAN as shown below.

An external Remote Compass Module (RCM) is required to transmit the heading and position information on Info-CAN if either:

- The Base Radio is present in a system configuration with no Telematics control module.
- The radio variant without GPS is present in a system configuration with no Telematics control module.

Media Disc Player (if equipped)

The Remote Media Player feature sends information through a USB connection to the Rear Seat Infotainment and outputs digital audio/video to vehicle displays and to the Radio over the Ethernet bus. The Rear Seat Infotainment system also has a USB hub with an auxiliary port for digital media file access.

The media disc player receives battery power and ground from the vehicle harness.

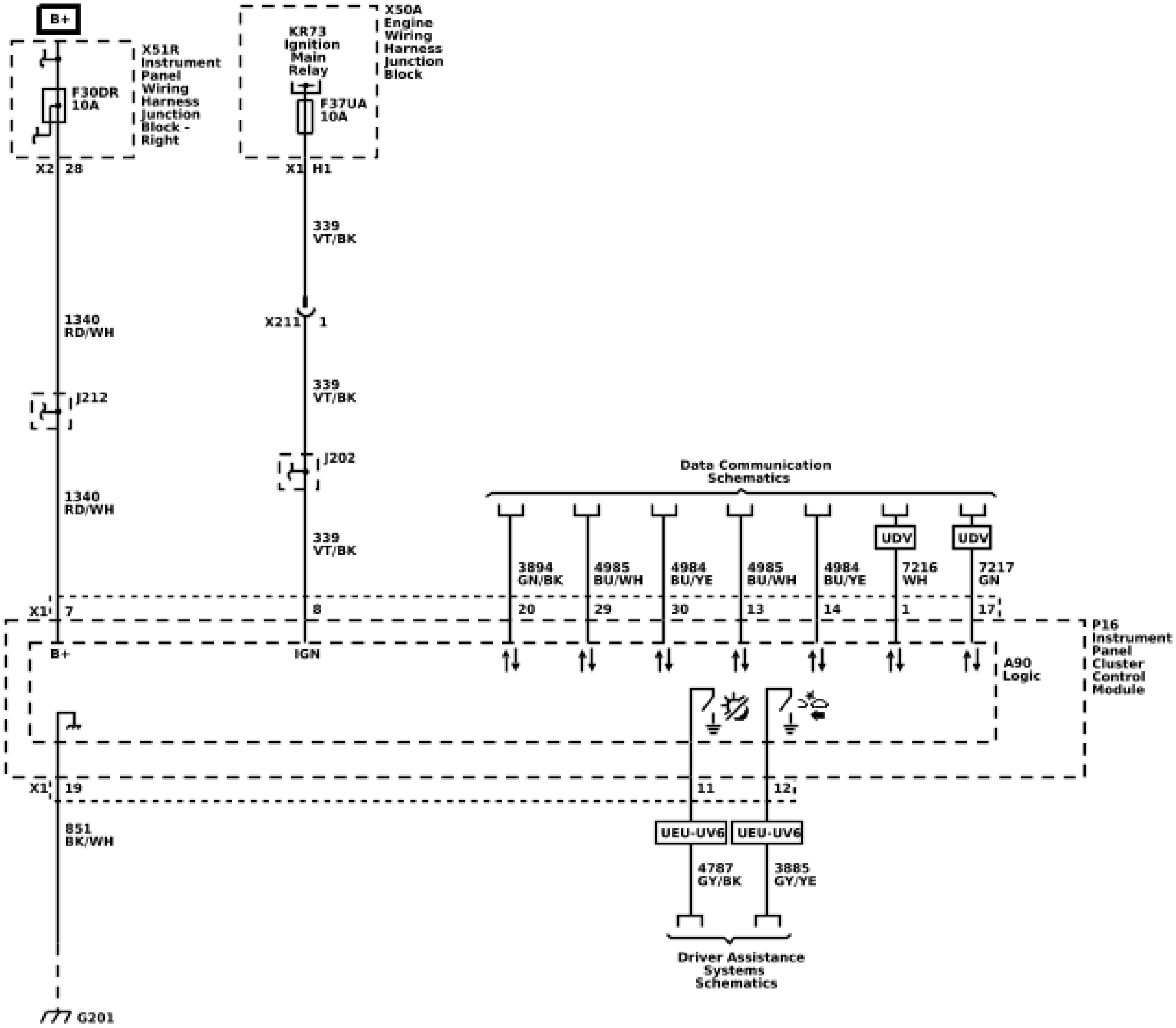
Digital Rearview Camera (if equipped)

For model year 2018 (and forward), the digital rearview camera is a direct input to the radio via coaxial cable. Camera and image activation are driven by reverse gear signal from the reverse lamp input. This function is used for reverse guidance. For radio systems that manage the camera signal, the system does not have video bypass module, as this functionality is managed onboard the radio.

Displays and Gauges

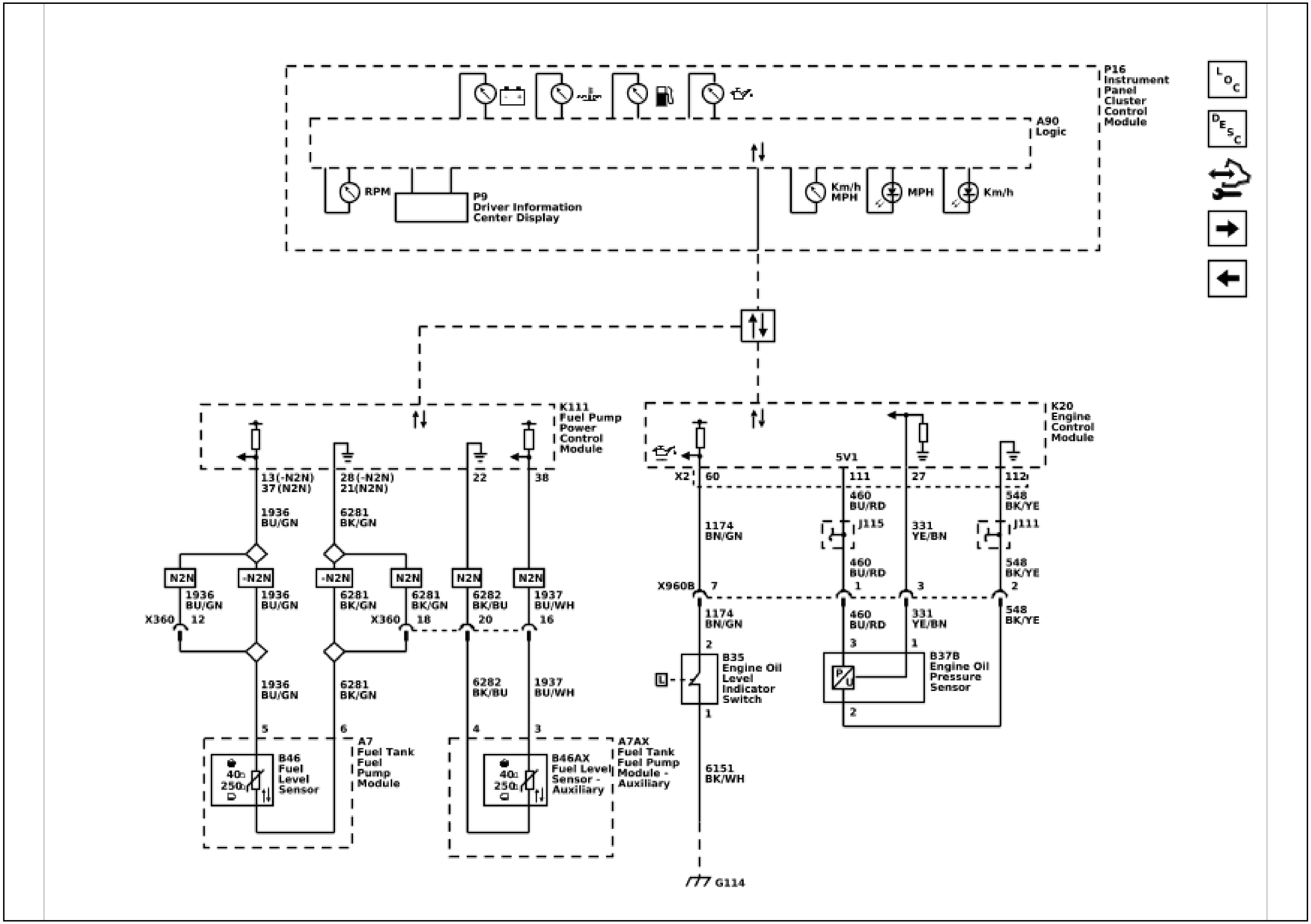
Schematic and Routing Diagrams

Instrument Cluster Schematics (Power, Ground and Serial Data)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F30DR 10A
X2 28
1340 RD/WH
J212
1340 RD/WH
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F37UA 10A
X1 H1
339 VT/BK
X211 1
339 VT/BK
J202
339 VT/BK
Data Communication Schematics
UDV
UDV
3894 GN/BK
4985 BU/WH
4984 BU/YE
4985 BU/WH
4984 BU/YE
7216 WH
7217 GN
X1 7
8
20
29
30
13
14
1
17
B+
IGN
A90 Logic
P16 Instrument Panel Cluster Control Module
X1 19
11
12
851 BK/WH
UEU-UV6
UEU-UV6
4787 GY/BK
3885 GY/YE
Driver Assistance Systems Schematics
G201

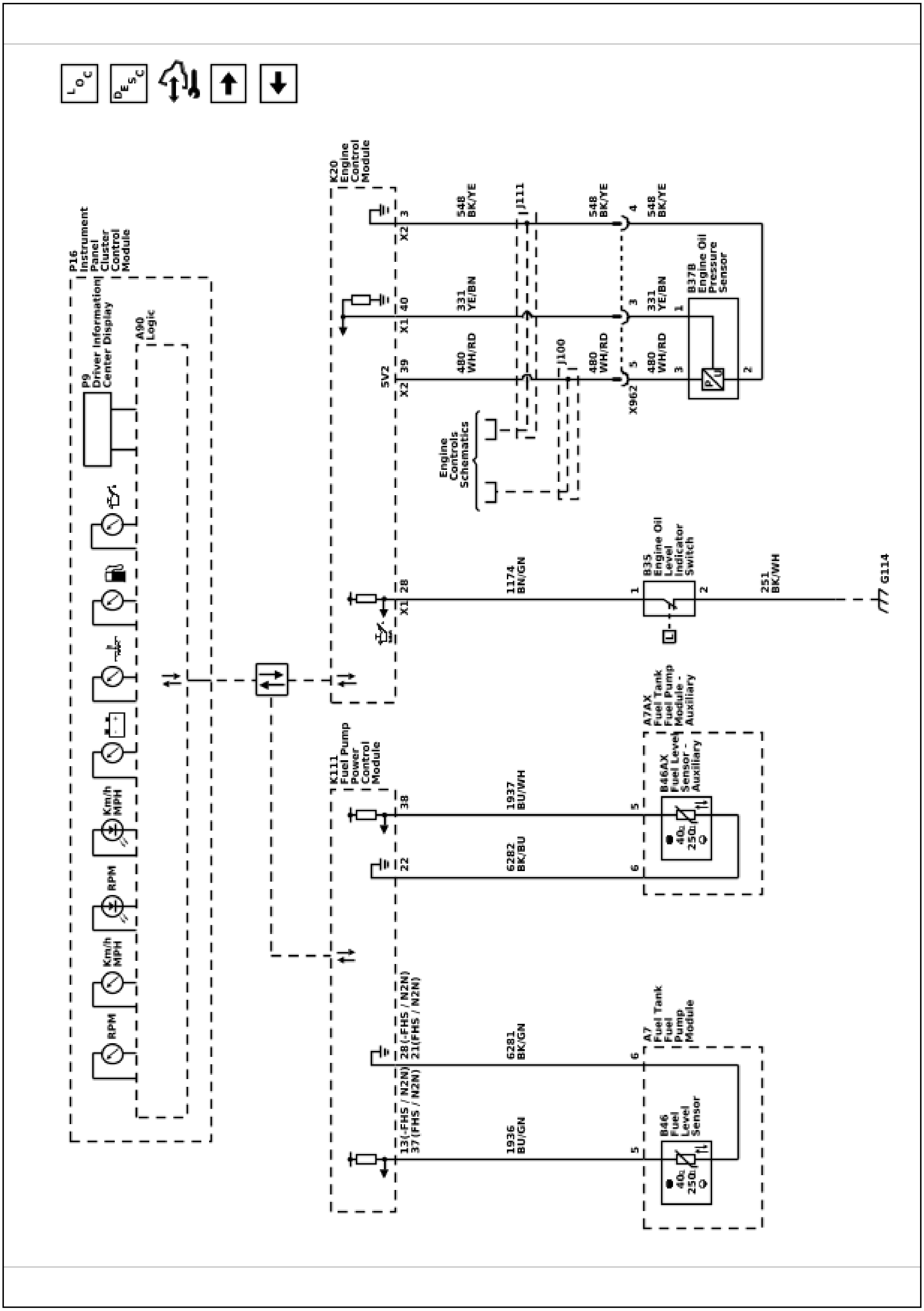
6846230

Instrument Cluster Schematics (Gauges (L5P))

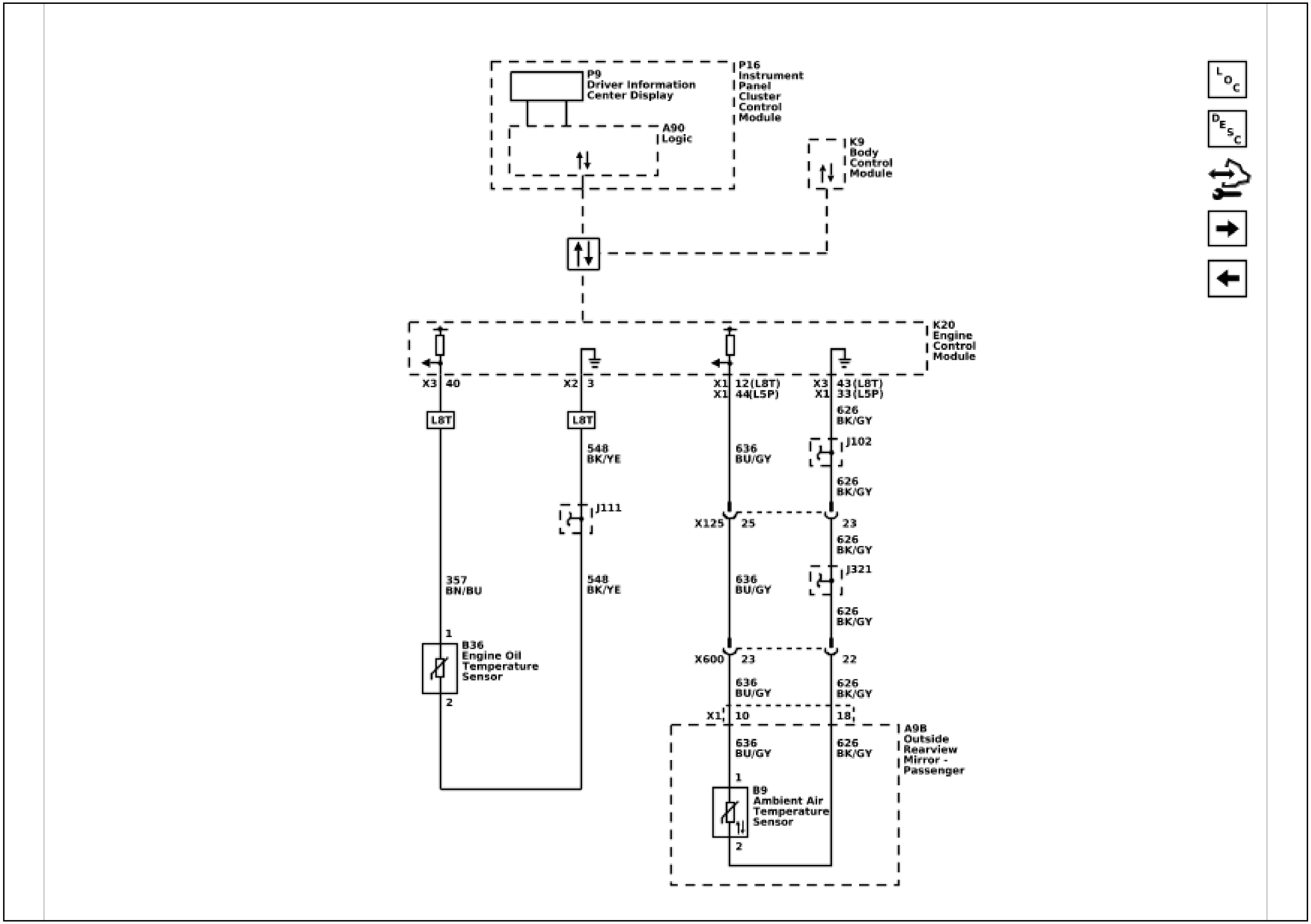

P16 Instrument Panel Cluster Control Module
A90 Logic
RPM
P9 Driver Information Center Display
Km/h MPH
MPH
Km/h
K111 Fuel Pump Power Control Module
13(-N2N) 37(N2N)
28(-N2N) 21(N2N)
22
38
1936 BU/GN
6281 BK/GN
N2N
-N2N
-N2N
N2N
N2N
N2N
1936 BU/GN
1936 BU/GN
6281 BK/GN
6281 BK/GN
6282 BK/BU
1937 BU/WH
X360
12
X360
18
20
16
1936 BU/GN
6281 BK/GN
6282 BK/BU
1937 BU/WH
5
6
4
3
40Ω
250Ω
B46 Fuel Level Sensor
A7 Fuel Tank Fuel Pump Module
40Ω
250Ω
B46AX Fuel Level Sensor - Auxiliary
A7AX Fuel Tank Fuel Pump Module - Auxiliary
K20 Engine Control Module
X2
60
5V1
111
27
112
1174 BN/GN
460 BU/RD
J115
331 YE/BN
548 BK/YE
J111
460 BU/RD
548 BK/YE
X960B
7
1
3
2
1174 BN/GN
460 BU/RD
331 YE/BN
548 BK/YE
2
B35 Engine Oil Level Indicator Switch
L
1
3
1
B37B Engine Oil Pressure Sensor
2
6151 BK/WH
G114
L O C
D E S C

6846231

Instrument Cluster Schematics (Gauges (L8T))

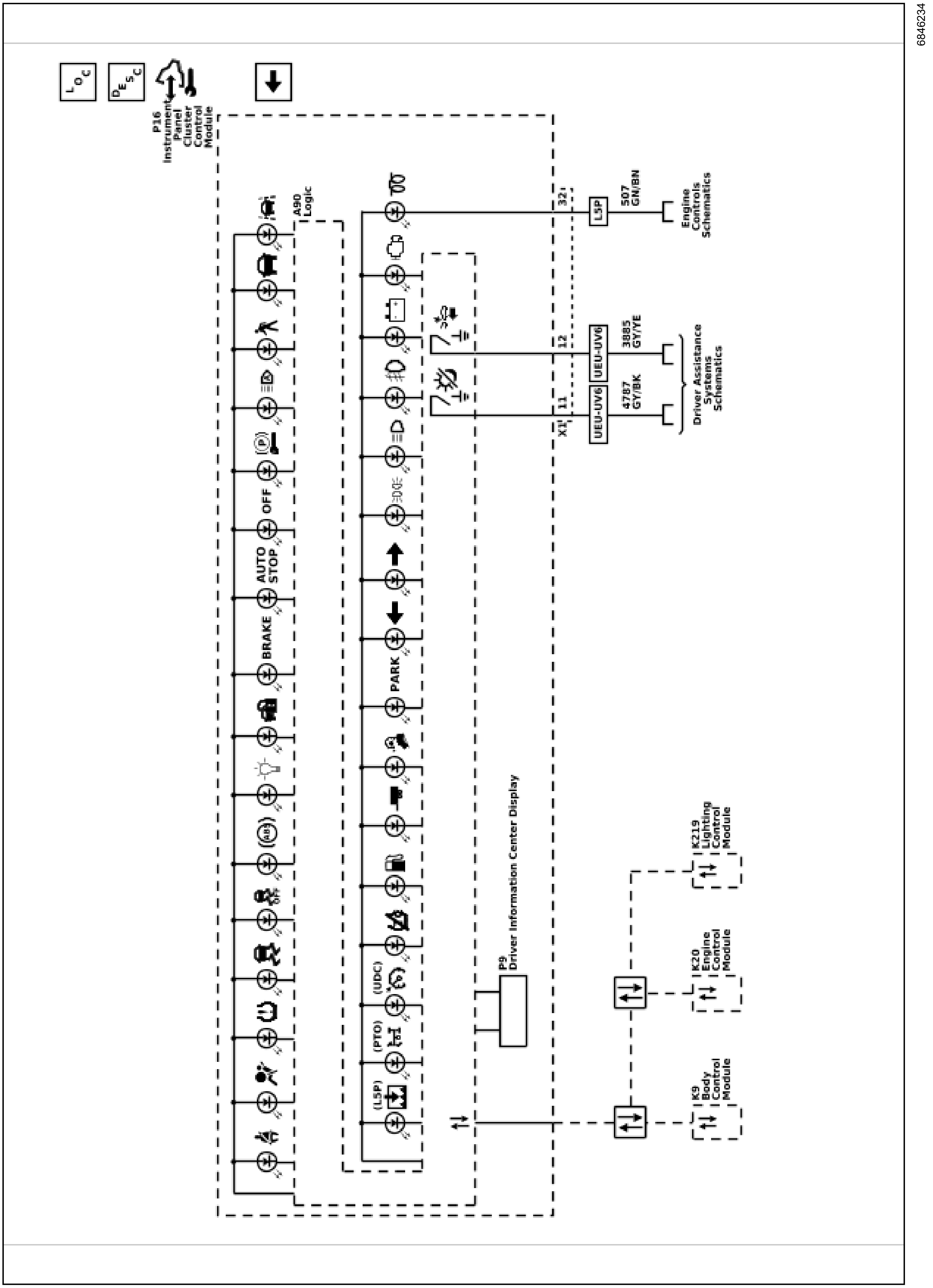

6846232
LOC
DESC
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
RPM
Km/h MPH
RPM
Km/h MPH
K20 Engine Control Module
X2 3
548 BK/YE
J111
548 BK/YE
4
548 BK/YE
B378 Engine Oil Pressure Sensor
X1 40
331 YE/BN
3
331 YE/BN
1
5V2
X2 39
480 WH/RD
J100
480 WH/RD
5
480 WH/RD
3
2
X962
Engine Controls Schematics
X1 28
1174 BN/GN
B35 Engine Oil Level Indicator Switch
1
2
251 BK/WH
G114
K111 Fuel Pump Power Control Module
38
1937 BU/WH
5
22
6282 BK/BU
6
A7AX Fuel Tank Fuel Pump Module - Auxiliary
B46AX Fuel Level Sensor - Auxiliary
40Ω
250Ω
28(-FHS / N2N)
21(FHS / N2N)
6281 BK/GN
6
A7 Fuel Tank Fuel Pump Module
13(-FHS / N2N)
37 (FHS / N2N)
1936 BU/GN
5
B46 Fuel Level Sensor
40Ω
250Ω

Instrument Cluster Schematics (Engine Oil Temperature and Ambient Temperature)

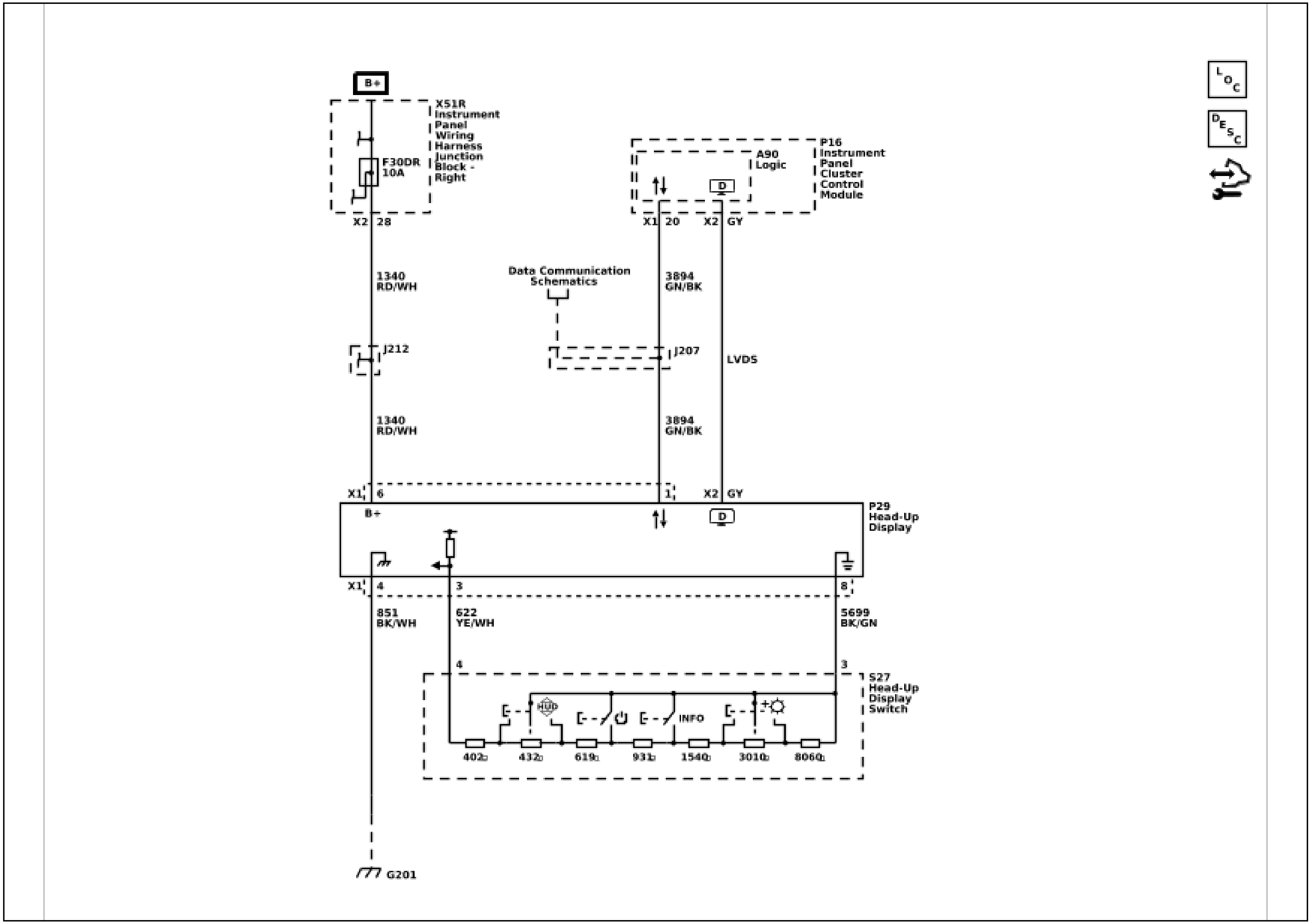

P9
Driver Information
Center Display
P16
Instrument
Panel
Cluster
Control
Module
A90
Logic
K9
Body
Control
Module
K20
Engine
Control
Module
X3 40
X2 3
X1 12(L8T)
X1 44(L5P)
X3 43(L8T)
X1 33(L5P)
L8T
L8T
626
BK/GY
J102
548
BK/YE
636
BU/GY
626
BK/GY
J111
X125 25
23
626
BK/GY
J321
357
BN/BU
548
BK/YE
636
BU/GY
626
BK/GY
1
B36
Engine Oil
Temperature
Sensor
2
X600 23
22
636
BU/GY
626
BK/GY
X1 10
18
A98
Outside
Rearview
Mirror -
Passenger
636
BU/GY
626
BK/GY
1
B9
Ambient Air
Temperature
Sensor
2

6846233

Instrument Cluster Schematics (Indicators)

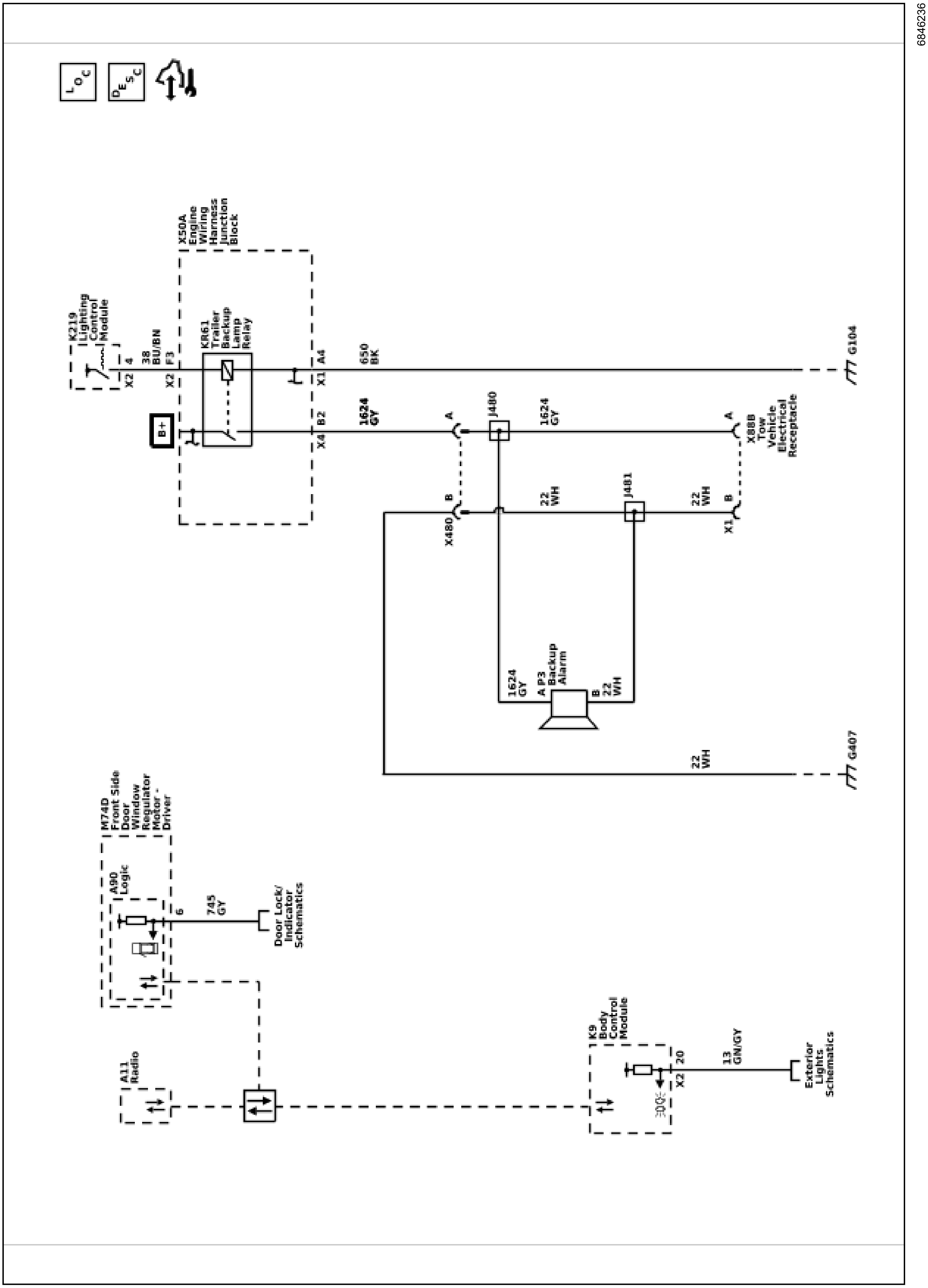

6846234
LOC
DESC
P16
Instrument Panel Cluster Control Module
A90
Logic
AUTO STOP
OFF
BRAKE
PARK
(L5P)
(PTO)
(UDC)
32
12
11
X1
L5P
507
GN/BN
Engine Controls Schematics
UEU-UV6
3885
GY/YE
UEU-UV6
4787
GY/BK
Driver Assistance Systems Schematics
P9
Driver Information Center Display
K9
Body Control Module
K20
Engine Control Module
K219
Lighting Control Module

Head-Up Display Schematics (Head-Up Display (UV6))


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F30DR 10A
X2 28
1340 RD/WH
J212
1340 RD/WH
Data Communication Schematics
J207
P16 Instrument Panel Cluster Control Module
A90 Logic
D
X1 20
X2 GY
3894 GN/BK
3894 GN/BK
LVDS
X1 6
1
X2 GY
P29 Head-Up Display
B+
D
X1 4
3
8
851 BK/WH
622 YE/WH
5699 BK/GN
4
3
S27 Head-Up Display Switch
HUD
INFO
402Ω
432Ω
619Ω
931Ω
1540Ω
3010Ω
8060Ω
G201

6846235

Audible Warnings Schematics (Audible Warnings)


6846236
K219 Lighting Control Module
X2 4
38 BU/BN
X2 F3
KR61 Trailer Backup Lamp Relay
X50A Engine Wiring Harness Junction Block
X1 A4
650 BK
G104
B+
X4 B2
1624 GY
A
J480
1624 GY
A
X88B Tow Vehicle Electrical Receptacle
B
X480
22 WH
J481
22 WH
B
X1
1624 GY
A P3 Backup Alarm
B 22 WH
22 WH
G407
M74D Front Side Door Window Regulator Motor - Driver
A90 Logic
6
745 GY
Door Lock/ Indicator Schematics
A11 Radio
K9 Body Control Module
X2 20
13 GN/GY
Exterior Lights Schematics

Description and Operation

Audible Warnings Description and Operation

The audible warnings alert the driver of a system concern or a critical vehicle condition. If equipped with an serial data communicating audio amplifier, the audio amplifier generates the audible warnings through the speakers. If not equipped with an audio amplifier, the radio generates the audible warnings through the speakers. The radio or audio amplifier receives audible warning requests via serial data. If the radio or audio amplifier receives multiple audible warning requests, the warning with the highest priority sounds first. Different audible warnings may sound with a different frequency or a different chime pattern, depending on the system or module making the request. The chime volume may be selectable through vehicle personalization.

Audible Warnings or Chimes

The following is a list of common audible warnings or chimes that may be present on the vehicle. For additional chimes or complete system description, refer to the appropriate system’s Description and Operation or the vehicle owner’s manual.

- Driver Seat Belt Reminder – If the vehicle is started and the seat belt is unbuckled, the BCM requests the radio or audio amplifier sound a chime to indicated that the belt is unbuckled. This is accompanied by a flashing driver seat belt indicator on the instrument cluster. If the belt remains unbuckled, the chime cycle may continue multiple times if the vehicle is driven and the indicator will remain on solid.
- Passenger Seat Belt Reminder – If the passenger presence system determines that their is an occupant in the passenger seat and the vehicle is started with the passenger seat belt unbuckled, the BCM requests the radio or audio amplifier sound a chime to indicated that the belt is unbuckled. This is accompanied by a flashing passenger seat belt indicator. If the belt remains unbuckled, the chime cycle may continue multiple times if the vehicle is driven and the indicator will remain on solid. If an object is placed on the passenger seat, the passenger presence system may interpret this as a passenger occupying the seat. Because the passenger seat belt is unbuckled, the passenger seat belt reminder chime will sound. To correct this, remove the object from the passenger seat.
- Exterior Lamps On Warning – If the exterior lamps are left on after the ignition is turned off and the driver door is opened, the BCM will request the radio or audio amplifier sound a chime as an indicator that the exterior lamps are on.
- Electric Parking Brake (if equipped) – If the electric parking brake switch is pressed while the vehicle is in motion, the parking brake control module will request the radio or audio amplifier sound a chime. To release the parking brake, the brake pedal must be pressed when the electric parking brake switch is pressed. If the brake pedal is not pressed, the parking brake control module will request the radio or audio amplifier sound a chime. A message will also appear on the driver information center.
- Delayed Locking – If the keyless entry transmitter is not in the vehicle and the door lock switch is pressed with the driver door open, the BCM will request the radio or audio amplifier sound a chime three times to indicate that the vehicle has entered a delayed locking state. The doors will automatically lock five seconds after the last door is closed.
- Object Detection – The object detection system sends various chime requests to the radio or audio amplifier during normal operation.
- REAR SEAT REMINDER LOOK IN REAR SEAT displays under certain conditions indicating there may be an item or passenger in the rear seat. This feature will activate when a second-row door is opened while the vehicle is on or up to 10 minutes before the vehicle is turned on. There will be an alert when the vehicle is turned off. The alert does not directly detect objects in the rear seat; instead, under certain conditions, it detects when a rear door is opened and closed, indicating that there may be something in the rear seat.

Additional Warnings

The following warnings have an associated instrument cluster indicator or driver information center message:

- Turn Signal Indicators – The radio or audio amplifier activates the audible warning as requested by the BCM.
- Vehicle Overspeed Message – The radio or audio amplifier activates the audible warning as requested by the BCM.
- Fuel Level Low Message – The radio or audio amplifier activates the audible warning as requested by the BCM.
- Oil Pressure Indicator – The radio or audio amplifier activates the audible warning as requested by the BCM.
- Tire Pressure Low Indicator – The radio or audio amplifier activates the audible warning as requested by the BCM.
- Antilock Brake Indicator – The radio or audio amplifier activates the audible warning as requested by the electronic brake control module.

- Engine Cooling System Messages – The radio or audio amplifier activates the audible warning as requested by the engine control module.
- Transmission Messages – The radio or audio amplifier activates the audible warning as requested by the transmission control module.

Backup Alarm (with 8S3)

When transmission placed in reverse, the Body Control Module (BCM) activates the KR61 Trailer Backup Lamps Relay which supplies 12V to the reverse lamps and the Backup Alarm simultaneously.

Head-Up Display Description and Operation

The head-up display projects an image on the windshield that is viewed from the driver seat. Information that is relevant to what the drive is currently doing is displayed, as well as any safety-critical information as it is happening.

The components of the head-up display are:

- Head-Up Display
- Instrument Cluster
- Head-Up Display Switch

Head-Up Display

The head-up display is a slave device to the instrument cluster. The head-up display is powered through ignition voltage and ground. It communicates directly with instrument cluster via serial data and only has limited self-diagnosis capacity. Head-up display DTCs are reported through the instrument cluster.

The head-up display projects a full color image onto the windshield and is only viewable from the driver seat. The image location and brightness is adjustable using the head-up display switch. The image information is received from the instrument cluster through a video cable.

On some models, the head-up display image rotation is also adjustable in the DIC customizations using the steering wheel controls.

Instrument Cluster

The instrument cluster sends the image information to the head-up display via a discrete video cable. The image sent to the head-up display is closely related to the information currently being displayed on the instrument cluster or driver information center. For example, if an incoming phone call is displayed in the cluster, this information will be displayed on the head-up display. If a navigation alert is shown in the cluster, then a turn-by-turn alert will display on the head-up display. When the operator interacts with the instrument cluster using the steering wheel mounted driver information center switch, the head-up display also responds to the interaction. If the operator dismisses the navigation alert on the instrument cluster, it is also removed from the head-up display.

Head-Up Display Switch

The head-up display switch is a multiplexed switch that controls the head-up display based on driver inputs. The head-up display provides the switch with a low reference and monitors a signal circuit. The head-up display switch is made up of a resistor ladder and three switches: Dim +/-, Up/Down, and Page. When a switch is pressed, the signal voltage is pulled low through the resistor ladder. When pressed, each of the switches will result in a different signal voltage seen by the head-up display, depending on the switch’s location on the resistor ladder.

Head-Up Display Operation

In normal operation, the operator may select from three different display configurations. These display configurations provide the operator with different information, with the vehicle speed being the primary item, along with the following standard indicators:

- Turn signal indicators
- High beam indicator
- Lane departure warning indicator (if equipped)
- Vehicle detected ahead indicator (if equipped)
- Adaptive cruise control on indicator (if equipped)

Standard/Speed Configuration
The head-up display projects only the vehicle speed. Additionally, the outside air temperature, compass, and time may also be displayed.

Audio Configuration
The head-up display will project the current audio information when listening to the audio system and the active phone information if the operator is on a phone call.

Navigation Configuration
The head-up display will project navigation information. If a current route is being followed, turn by turn instruc-

tions and arrows will be displayed. If no route is programed, the compass heading is displayed.

Performance Configuration
The head-up display will project RPM and PRNDL information.

Adaptive Cruise Control Configuration (if equipped)
The head-up display will project the selected following distance when adaptive cruise control is active.

Indicator/Warning Message Description and Operation

INDICATOR LIGHT ON

Refer to the OWNER'S MANUAL for the descriptions and explanations of all indicator lights.

For diagnosis and repair information related to an indicator light refer to the System Diagnosis and the Description of Operation that the message relates to.

MESSAGE DISPLAYED

Refer to the OWNER'S MANUAL for descriptions and explanations of all messages displayed.

For diagnosis and repair information related to a displayed message refer to the System Diagnosis and the Description of Operation that the message relates to.

CHANGE TIMING BELT MESSAGE (without LWN/LIH)

The Instrument Cluster monitors the odometer mileage to determine when timing belt (if equipped) replacement may be necessary. After the vehicle has accumulated approximately 100,000 miles (160,000 kilometers), the Instrument Cluster may display the CHANGE TIMING BELT message. After the engine timing belt has been replaced, reset the CHANGE TIMING BELT message by locating and removing the fuses that supply power to the Instrument Cluster for two minutes.

CHANGE TIMING BELT MESSAGE (LWN/LIH)

The Instrument Cluster monitors the odometer mileage to determine when timing belt replacement may be necessary. After the vehicle has accumulated approximately 150,000 miles (240,000 kilometers), the Instrument Cluster may display the CHANGE TIMING BELT message. After the engine timing belt and oil pump drive belts have been replaced, reset the CHANGE TIMING BELT message by performing the Instrument Cluster control function Timing Belt Life Reset (if available), using the scan tool. Without scan tool control function, reset the CHANGE TIMING BELT message by locating and removing the fuses that supply power to the Instrument Cluster for two minutes.

BRAKES OVERHEATED

The Electronic Brake Control Module monitors brake usage and compares it to an internal thermal model to determine if the brakes could become overheated. If the Electronic Brake Control Module determines the brakes pads have exceeded a desirable temperature based on the thermal model, it sends a serial data message to the Instrument Cluster to display the BRAKES OVERHEATED message. The message remains displayed until the estimated temperature returns to a desirable range.

Transmission Shift Lever Position Indicator

The Transmission Shift Lever Position Indicator (if equipped) is located on the center console and indicates the current transmission shift lever position. The Transmission Shift Lever Position Indicator receives power and ground and is controlled by the Body Control Module (BCM) via serial data. The Transmission Control Module determines transmission shift lever position based on signals from the Transmission Internal Mode Switch and sends the shift lever position information to the BCM via serial data.

Instrument Cluster Description and Operation

Instrument Cluster (with RPO UDC)

The instrument cluster is a multifunction module that provides the vehicle operator with information that is critical to vehicle operation, such as vehicle speed, engine RPM, oil pressure, battery voltage, fuel level, and coolant temperature, using analog gauges. The instrument cluster also provides the operator with operational warnings and message through various indicators and the driver information center. The driver information center is a one color multifunction display that is located in the instrument cluster. The driver information center has several screens that can be controlled using the steering column mounted driver information display switch.

Instrument Cluster (with RPO UDD)

The instrument cluster is a multifunction module that provides the vehicle operator with information that is critical to vehicle operation, such as vehicle speed, engine RPM, and coolant temperature, using analog gauges. The instrument cluster also provides the operator with operational warnings and message through various indicators and the driver information center. The driver information center is a full color multifunction display that is located in the instrument cluster. The driver information center is also tightly integrated with the vehicle's infotainment system and is highly reconfigurable. The driver information center is controlled using the steering wheel control switches which connect to the Instrument Cluster via serial data.

Instrument Cluster (with RPO UHS)

The instrument cluster is a multifunction module that provides the vehicle operator with information such as vehicle speed and engine RPM using analog gauges. Oil pressure, battery voltage, fuel level, and coolant temperature can also be displayed using an interactive LCD display. The instrument cluster is highly reconfigurable, with four different themes available for selection. The instrument cluster also provides the operator with operational warnings and message through various indicators and the driver information center. Because the instrument cluster is an LCD display, driver information center elements are located in various zones of the display, depending on how the instrument panel is configured. The driver information center is controlled using the steering wheel control switches which connect to the Instrument Cluster via serial data.

Instrument Cluster (with RPO UDV)

The instrument cluster is a multifunction module that provides the vehicle operator with information that is critical to vehicle operation, such as vehicle speed, engine RPM, and coolant temperature, using an interactive LCD display. The instrument cluster is highly reconfigurable, with four different themes available for selection. The instrument cluster also provides the operator with operational warnings and message through various indicators and the driver information center. Because the instrument cluster is an LCD display, driver information center elements are located in various zones of the display, depending on how the instrument panel is configured. The driver information center is controlled using the steering wheel control switches which connect to the Instrument Cluster via serial data.

Indicators and Warning Messages

Refer to *Indicator/Warning Message Description and Operation 5-42*.

Engine Coolant Temperature Gauge

The instrument cluster displays the engine coolant temperature as determined by the engine control module (ECM). The ECM sends the engine coolant temperature information via serial data to the instrument cluster to display the engine coolant temperature.

Engine Hours (if equipped)

The instrument cluster calculates, stores, and displays the accumulated engine hours as available information in the DIC area of the instrument cluster. The engine hours accumulate over the life of the vehicle. Although not used for display purposes, the ECM also receives the engine hours value from the instrument cluster.

Engine Oil Level Switch (if equipped)

The engine oil level sensor/switch is normally-closed with proper engine oil level. The switch opens when the engine oil level drops below a calibrated level. The engine control module (ECM) monitors the engine oil level signal circuit when the ignition is ON, and the engine is OFF. With the switch in the closed position, the ECM detects a low voltage on the signal circuit. With the switch in the open position, the ECM detects a high voltage on the signal circuit. When high voltage is detected on the signal circuit, the ECM will send a serial data message to the instrument cluster. The instrument cluster will then display a message on the driver information center (DIC) or illuminate a low engine oil level lamp.

The following information determines the message sent from the ECM to the instrument cluster:

- The Low Engine Oil Level message lamp is displayed only after the ECM detects a high voltage on the signal circuit for three consecutive ignition cycles, followed by an ignition OFF event from 15 minutes to greater than 50 minutes, depending on engine oil temperatures.
- The Low Engine Oil Level message is turned OFF when the ECM detects a low voltage on the signal circuit after an ignition OFF event for greater than 90 seconds, followed by an ignition ON event for less than 1 second.

Engine Oil Pressure Gauge (if equipped)

The instrument cluster displays the engine oil pressure as determined by the ECM. The engine oil pressure sensor changes voltage based on the engine oil pressure. The ECM monitors the signal circuit of the engine oil pressure sensor to determine if the engine oil pressure sensor voltage is within the normal operating range of approximately 1–4 V. The ECM sends the engine oil pressure information to the instrument cluster via serial data. The instrument cluster will illuminate or display the engine oil pressure indicator when the engine oil pressure is low. The engine oil pressure gauge defaults to 0 kPa (0 psi) if:

- The ECM detects a malfunction in the engine oil pressure sensor signal circuit.
- The instrument cluster detects a loss of serial data communication with the ECM.

Engine Oil Temperature Gauge (if equipped)

The instrument cluster may display the engine oil temperature as determined by the engine control module (ECM). The ECM sends the engine oil temperature information via serial data to the instrument cluster to display the engine oil temperature.

Fuel Gauge (Gasoline and Diesel)

The instrument cluster displays the fuel level based on the information from the ECM. The ECM converts the data from the fuel level sensors to a fuel level signal. The ECM sends the fuel level signal via serial data to the BCM. The BCM then sends the information via serial data to the instrument cluster to display the fuel level. If the fuel level falls under 11% the instrument cluster will illuminate the low fuel level indicator. The fuel gauge defaults to empty if:

- The ECM detects a malfunction in the fuel level sensor circuit.
- The BCM detects a loss of serial data communications with the ECM.
- The instrument cluster detects a loss of serial data communications with the BCM.

Speedometer

The instrument cluster displays the vehicle speed based on the information from the ECM. The ECM sends the vehicle speed information via serial data to the BCM. The BCM then sends the vehicle speed information via serial data to the instrument cluster to display the vehicle speed.

Odometer

The instrument cluster displays the vehicle odometer in the driver information center. The ECM send a distance rolling count message via serial data to the body control module (BCM). The BCM uses this information to calculate the vehicle odometer. This odometer value is then sent to the instrument cluster. The instrument cluster does not calculate the odometer.

The odometer value is stored in multiple modules. The instrument cluster is a secondary storage module for the odometer, while the BCM is the primary storage and accumulator.

In addition to storing the odometer value for the vehicle, the instrument cluster and the BCM store the VIN. Software checks are performed to ensure these modules, and their stored odometer information, can not be move or transferred between different vehicles.

Tachometer

The instrument cluster displays the engine speed based on the information from the ECM. The ECM converts the data from the crankshaft position sensor to an engine revolution signal. The ECM sends the engine speed information via serial data to the BCM. The BCM then sends the information via serial data to the instrument cluster to display the engine speed.

Compass

The vehicle compass information is gather through the compass module or vehicle communication interface module (VCIM). The compass module or VCIM determines vehicle direction and communicates this with the BCM through serial data. The BCM sends the compass information to the instrument cluster via serial data, where it is displayed.

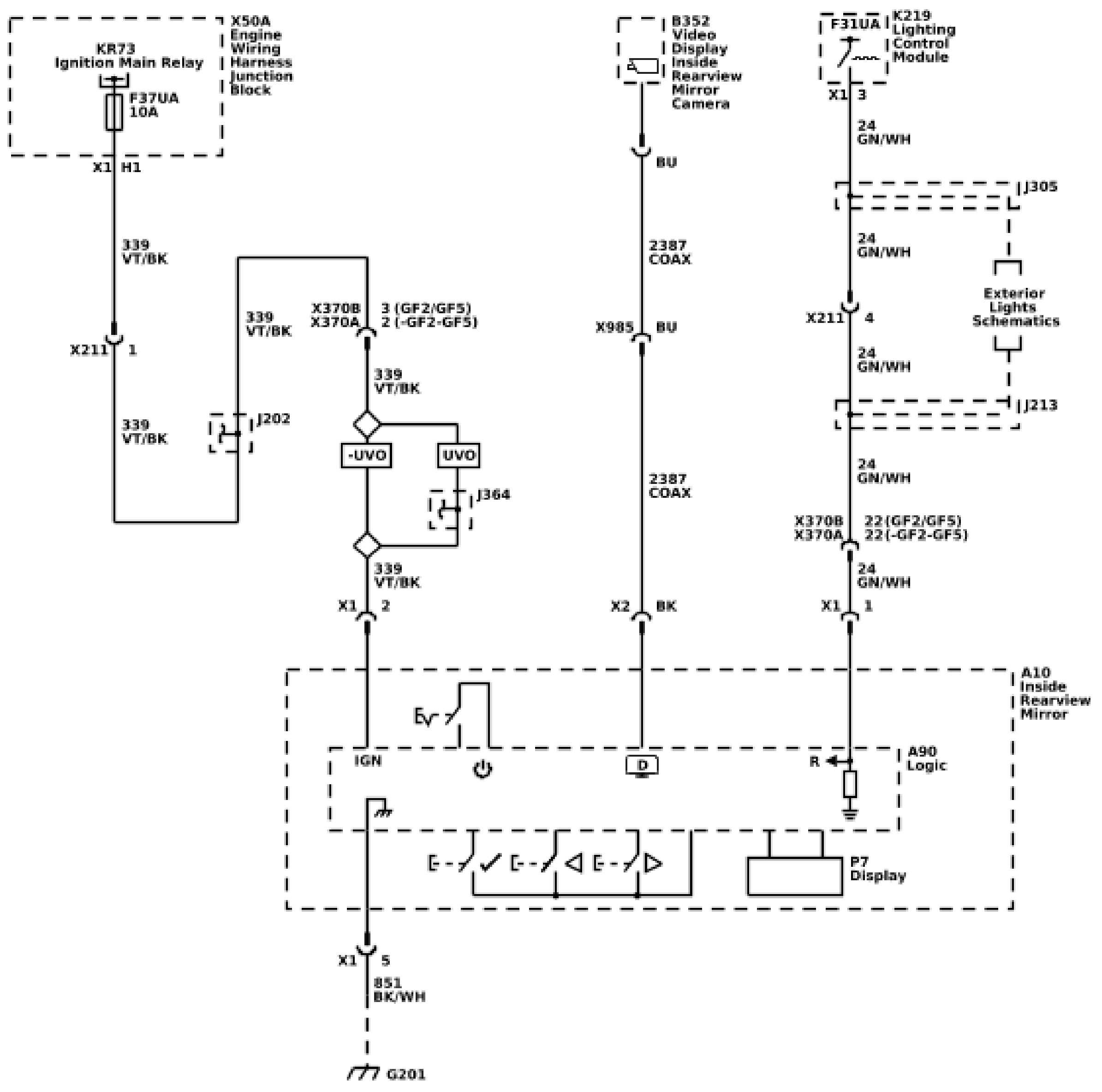
Outside Air Temperature

The Ambient Air Temperature Sensor is located in the Passenger Outside Rearview Mirror and varies it's resistance with temperature. The Engine Control Module (ECM) reads the resistance value to determine temperature. The time of and rate of the temperature update is based on an algorithm in the Engine Control Module (ECM) software. Factors such as, last reading, current reading, length of time vehicle is been off/on, power mode, vehicle speed, driven distance, and sensor location are all considered by the Engine Control Module (ECM) to know when to update the displayed temperature on the Info Display Module. For example, if the sensor is located near the engine compartment, and the vehicle has been turned off for only 10 minutes then restarted, the ECM will wait until the vehicle is driven to get more accurate air flow across the sensor before it updates the display.

Image Display Cameras

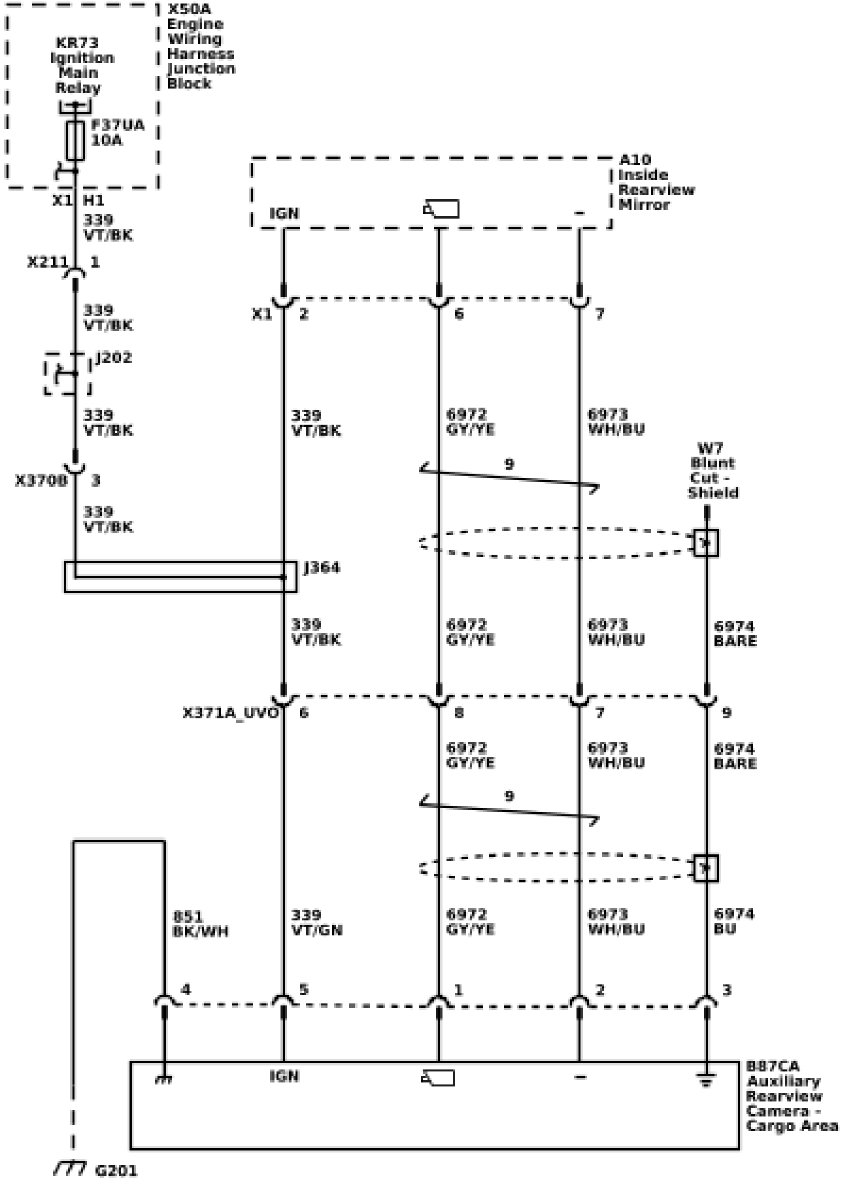
Schematic and Routing Diagrams

Image Display Camera Schematics (Inside Rearview Mirror Camera (DRZ))


X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F37UA 10A
X1 H1
339 VT/BK
X211 1
339 VT/BK
J202
339 VT/BK
X370B X370A
3 (GF2/GF5)
2 (-GF2-GF5)
339 VT/BK
-UVO
UVO
J364
339 VT/BK
X1 2
B352 Video Display Inside Rearview Mirror Camera
BU
2387 COAX
X985 BU
2387 COAX
X2 BK
K219 Lighting Control Module
F31UA
X1 3
24 GN/WH
J305
24 GN/WH
Exterior Lights Schematics
X211 4
24 GN/WH
J213
24 GN/WH
X370B X370A
22 (GF2/GF5)
22 (-GF2-GF5)
24 GN/WH
X1 1
A10 Inside Rearview Mirror
A90 Logic
IGN
D
R
P7 Display
X1 5
851 BK/WH
G201

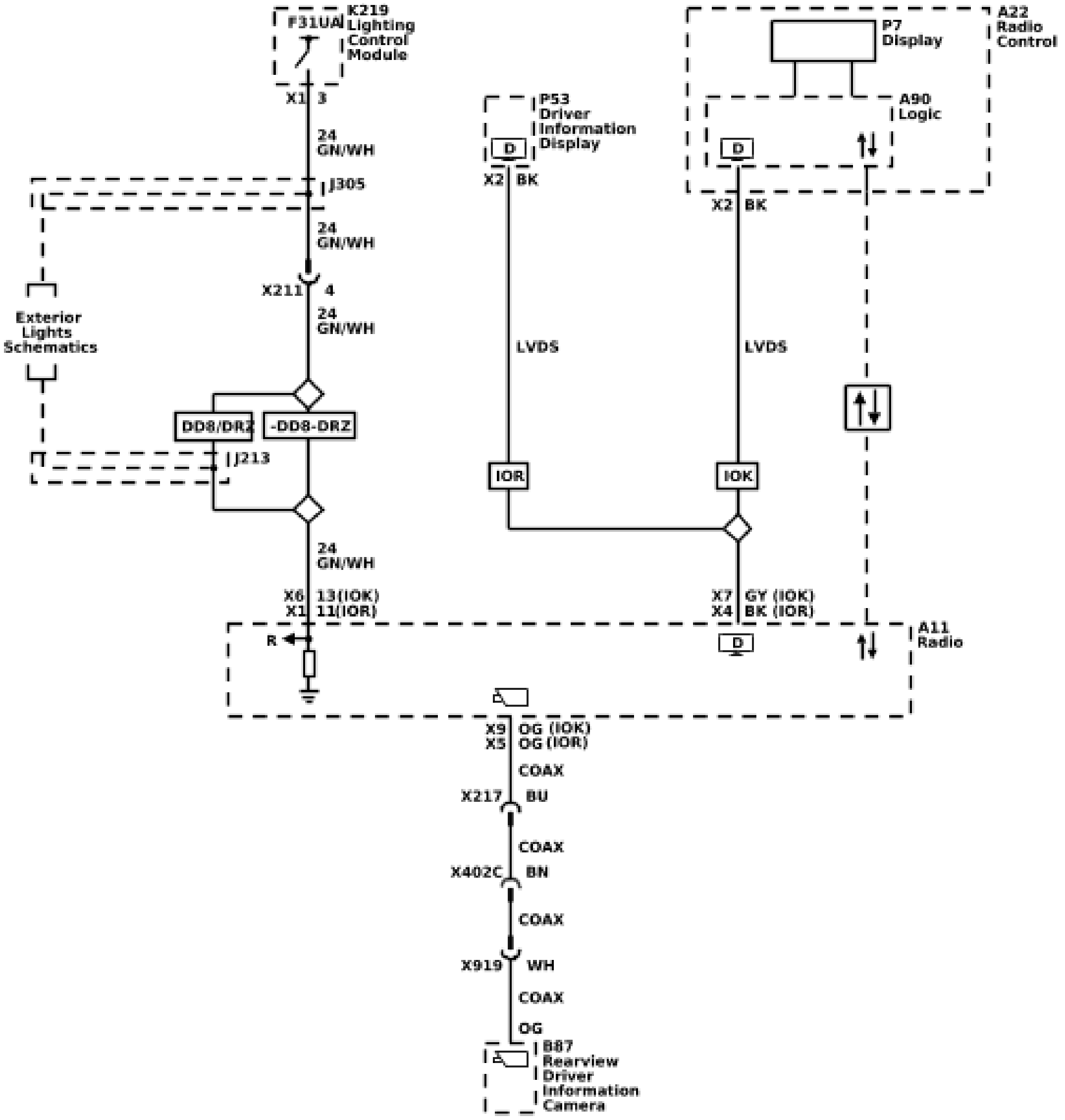
6846237

Image Display Camera Schematics (Inside Rearview Mirror Camera (UVO))


X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F37UA 10A
X1 H1
339 VT/BK
X211 1
339 VT/BK
J202
339 VT/BK
X370B 3
339 VT/BK
J364
A10 Inside Rearview Mirror
IGN
X1 2
6
7
339 VT/BK
6972 GY/YE
6973 WH/BU
9
W7 Blunt Cut - Shield
339 VT/BK
6972 GY/YE
6973 WH/BU
6974 BARE
X371A_UVO 6
8
7
9
6972 GY/YE
6973 WH/BU
6974 BARE
9
851 BK/WH
339 VT/GN
6972 GY/YE
6973 WH/BU
6974 BU
4
5
1
2
3
IGN
B87CA Auxiliary Rearview Camera - Cargo Area
G201

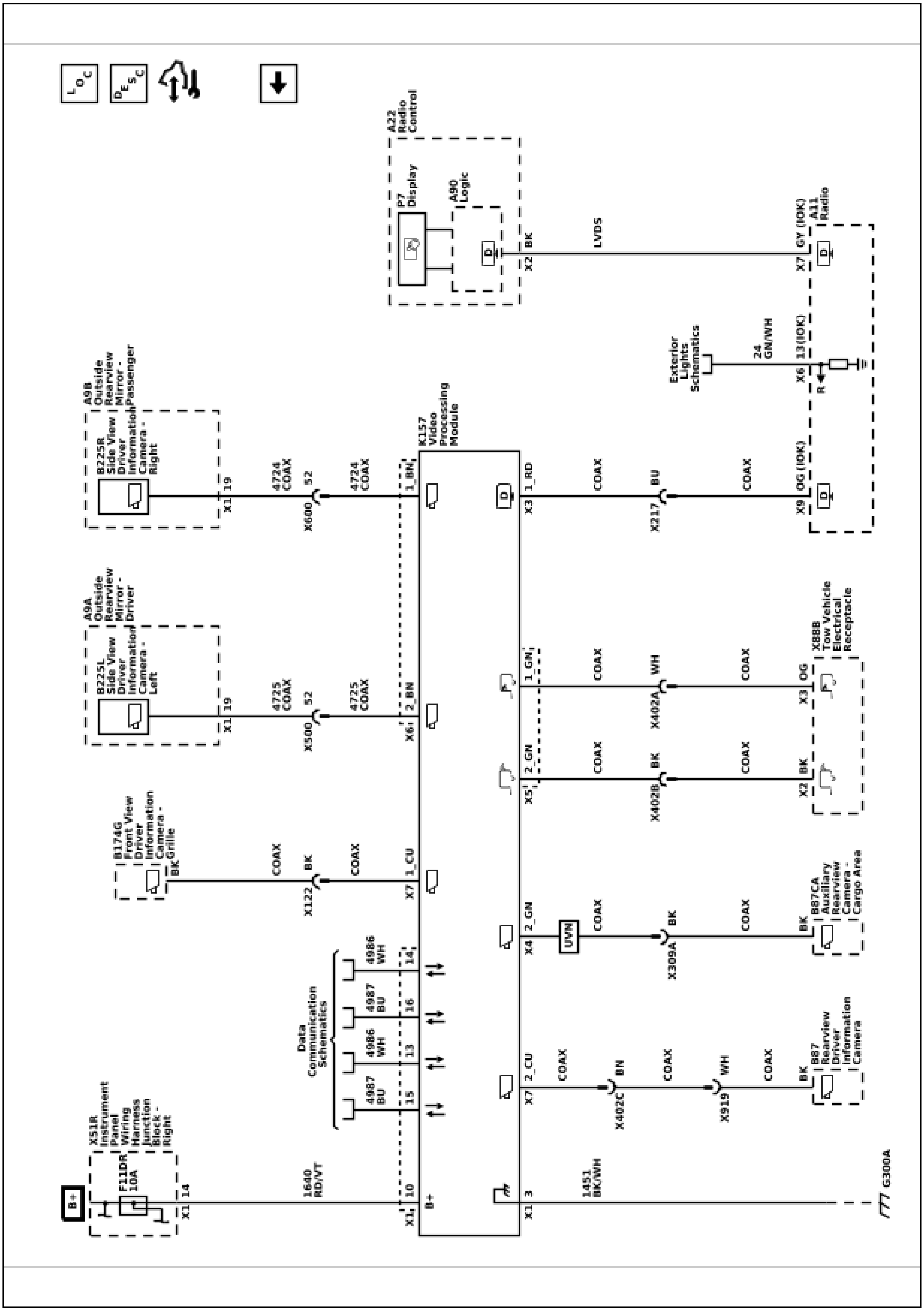
6846238

Image Display Camera Schematics (Rearview Driver Information Camera (UDU/UVB))


K219 Lighting Control Module
F31UA
X1 3
24 GN/WH
J305
24 GN/WH
X211 4
24 GN/WH
Exterior Lights Schematics
DD8/DRZ
-DD8-DRZ
J213
24 GN/WH
X6 13(IOK)
X1 11(IOR)
R
P53 Driver Information Display
D
X2 BK
LVDS
IOR
A22 Radio Control
P7 Display
A90 Logic
D
X2 BK
LVDS
IOK
X7 GY (IOK)
X4 BK (IOR)
A11 Radio
D
X9 OG (IOK)
X5 OG (IOR)
COAX
X217 BU
COAX
X402C BN
COAX
X919 WH
COAX
OG
B87 Rearview Driver Information Camera

6846239

Image Display Camera Schematics (Surround Vision (UV2))


6846240
B+
F11DR 10A
X51R Instrument Panel Wiring Harness Junction Block - Right
X1 14
1640 RD/VT
X1 10 B+
Data Communication Schematics
4987 BU
4986 WH
4987 BU
4986 WH
15
13
16
14
B174G Front View Driver Information Camera - Grille
BK
COAX
BK
X122
COAX
X7 1_CU
B225L Side View Driver Information Camera - Left
A9A Outside Rearview Mirror - Driver
X1 19
4725 COAX
52
X500
4725 COAX
X6 2_BN
B225R Side View Driver Information Camera - Right
A9B Outside Rearview Mirror - Passenger
X1 19
4724 COAX
52
X600
4724 COAX
1_BN
K157 Video Processing Module
X1 3
1451 BK/WH
G300A
X7 2_CU
COAX
BN
X402C
COAX
WH
X919
COAX
BK
B87 Rearview Driver Information Camera
X4 2_GN
UVN
COAX
BK
X309A
COAX
BK
B87CA Auxiliary Rearview Camera - Cargo Area
X5 2_GN
COAX
BK
X402B
COAX
X2 BK
1_GN
COAX
WH
X402A
COAX
X3 OG
X88B Tow Vehicle Electrical Receptacle
X3 1_RD
COAX
BU
X217
COAX
X9 OG (IOK)
Exterior Lights Schematics
24 GN/WH
X6 13(IOK)
R
X7 GY (IOK)
A11 Radio
LVDS
X2 BK
A90 Logic
P7 Display
A22 Radio Control
LOC
DESC

Description and Operation

Rearview Camera Full Display Mirror Description and Operation

If equipped, full display mirror provides a wider field of view than normally seen from the inside rearview mirror to assist when driving and changing lanes. When the tab under the inside rearview mirror is pulled rearward, a view of the area behind the vehicle displays on the mirror. The inside rearview camera full display mirror is connected to the outside rearview camera via a shielded coaxial cable.

When the tab under the inside rearview mirror is pulled rearward, a view of the area behind the vehicle displays on the mirror.

Adjust the rearview mirror for a clear view of the area behind the vehicle before turning on full display mirror. Use the three buttons on the bottom of the mirror to adjust the brightness, zoom, and tilt of the display. Make sure the light sensor is not covered when adjusting the brightness.

The inside rearview camera full display mirror may not work properly or display a clear image if:

- It is dark.
- The sun or the beam of headlamps are shining directly into the camera lens.
- Ice, snow, mud, or anything else builds up on the camera lens. Clean the lens, rinse it with water, and wipe it with a soft cloth.

When the mirror detects that the camera is not sending a valid video signal, it “blue screens” with a “no video” decal for 3 seconds, then reverts back to the mirror.

Rearview Camera Full Display Mirror Description and Operation

Rear Vision Camera System Operation

The rear vision camera system consists of a video camera located at the rear of the vehicle and the A10 Inside Rearview Mirror

The cargo bed vision camera receives ignition voltage and a constant ground to power the camera. Video signal + and video signal – circuits carry the video image from the rear vision camera to the A10 Inside Rearview Mirror . Additionally, the video signal circuits are shielded to prevent any interference which may lead to a loss of video signal resolution and a degraded video image. The shield is provided a ground path by the rear vision camera.

The following conditions may cause a degraded cargo bed vision camera image:

- Ice, snow, or mud has built up on the rear vision camera
- Dark conditions
- Extreme light conditions, such as glare from the sun or the headlights of another vehicle
- Damage to the rear of the vehicle
- Extreme high temperatures or extreme temperature changes

Rear Vision Camera Description and Operation

Rear Vision Camera System Operation

The rear vision camera system consists of a video camera located at the rear of the vehicle and the A11 Radio.

When the transmission is placed into REVERSE, a signal is sent to the A11 Radio indicating that camera operation is requested. The rearview camera sends video information to the A11 Radio through a coax cable. The coax cable also provides power from the A11 Radio to the rearview camera.

The following conditions may cause a degraded rear vision camera image:

- Ice, snow, or mud has built up on the rear vision camera
- Dark conditions
- Extreme light conditions, such as glare from the sun or the headlights of another vehicle
- Damage to the rear of the vehicle
- Extreme high temperatures or extreme temperature changes

If a malfunction is detected in the system, SERVICE REAR VISION CAMERA may be displayed on the Info Display Module as an indicator to the customer that a problem exists that requires service.

Rear Vision Camera Description and Operation

Rear Vision Camera System Operation

The rear vision camera system consists of a video camera located at the rear of the vehicle and the Rado.

When the transmission is placed into REVERSE, a signal indicates to the Radio that the vehicle is in reverse and image display is requested. The rear vision camera receives ignition voltage and a constant ground to power the camera. Video signal + and video signal – circuits carry the video image from the rear vision camera to the radio. Additionally, the video signal circuits are shielded to prevent any interference which may lead to a loss of video signal resolution and a degraded video image. The shield is provided a ground path by the rear vision camera.

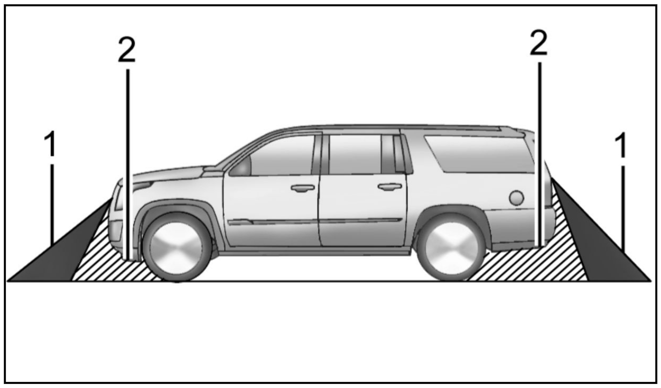
The following conditions may cause a degraded rear vision camera image:

- Ice, snow, or mud has built up on the rear vision camera
- Dark conditions
- Extreme light conditions, such as glare from the sun or the headlights of another vehicle
- Damage to the rear of the vehicle
- Extreme high temperatures or extreme temperature changes

If a malfunction is detected in the system, Service Rear Vision Camera may be displayed on the Infotainment screen as an indicator to the customer that a problem exists that requires service.

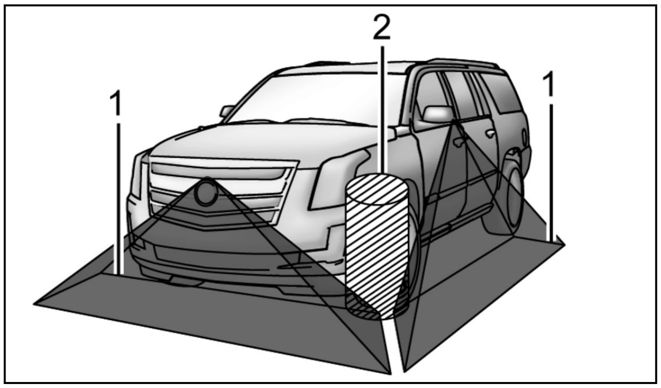
Surround Vision Camera Description and Operation

Warning: The Surround Vision cameras have blind spots and will not display all objects near the corners of the vehicle. Folding outside mirrors that are out of position may not display surround view correctly. Always check around the vehicle when parking or backing.



4291164

1. View displayed by the surround vision camera
2. Area not shown



4291749

1. View displayed by the surround vision camera
2. Area not shown

The surround vision camera system consists of the following components:

- B87 Rearview Camera
- B174G Frontview Camera – Grille
- K157 Video Processing Control Module
- A11 Radio **OR** K74 Human Machine Interface Module
- B225L Sideview Camera – Left
- B225R Sideview Camera – Right
- X20 Memory Card Receptacle (with XVR)

When the vehicle is traveling at speeds slower than 6 mph (10kph) the video processing control module will power up the cameras and send a video signal to the radio or human machine interface module.

The following conditions may cause a degraded surround vision camera image:

- Ice, snow, or mud has built up on the rear vision camera
- Dark conditions
- Extreme light conditions, such as glare from the sun or the headlights of another vehicle
- Damage to the rear of the vehicle
- Extreme high temperatures or extreme temperature changes

Surround Vision displays an overhead view of the area surrounding the vehicle, along with the front or rear camera views in the center stack. The front camera is in the grille or near the front emblem, the side cameras are on the bottom of the outside rearview mirrors, and the rear vision camera is above the license plate.

Note: Images from the Sideview Cameras are only displayed when both front doors are properly closed.

Features of the Surround Vision System

- Rear camera (B87 Rearview Camera) view alongside overhead view is displayed in reverse
- Front camera (B174G Frontview Camera – Grille) view alongside overhead view is displayed after shifting out of reverse to Neutral or Drive
- Will display front view when front park assist object is within trigger range calibration value (30 cm (12 in) in a forward gear
- Image is removed from display when vehicle speed exceeds speed calibration (10kph/6 mph) or button press / screen touch

System Operation
The video processing control module is connected to each camera via a shielded coaxial cable. The coaxial cable provides power for the camera and also carries the video image from the cameras to the video processing control module for processing. The video processing control module will then send the processed image output to infotainment system via another coaxial cable.

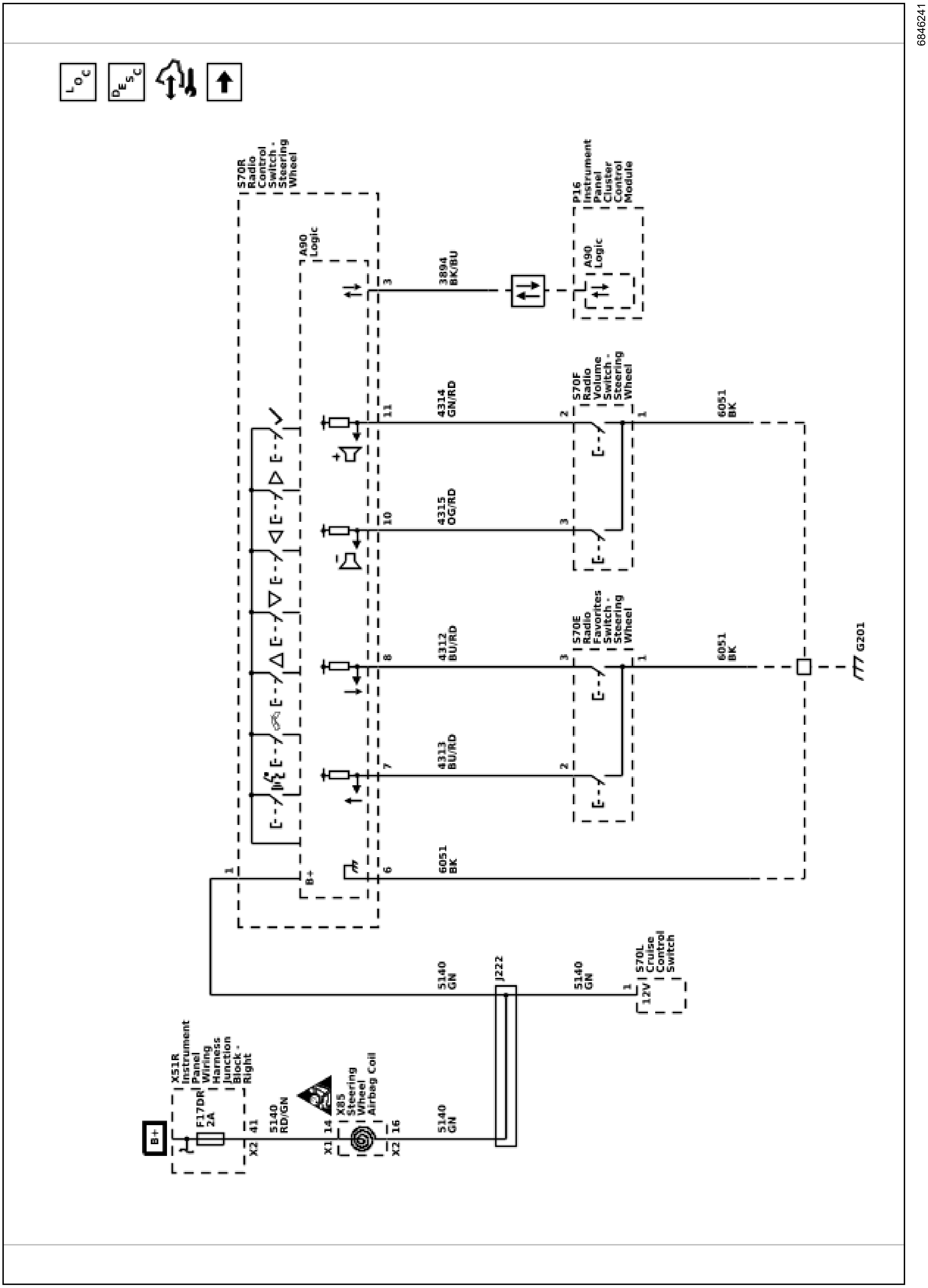
The video processing module receives various vehicle information (such as steering wheel angle, object detection, etc) from other sources such as parking assist modules and the Body Control Module via serial data. This information is used to produce the enhanced surround vision system images that include a warning triangle that may display if an object is detected nearby. This triangle changes from amber to red and increases in size as the object gets closer to the vehicle. Also, dynamic guidelines are displayed in Reverse to show the projected path of the vehicle based on steering wheel angle. Due to this use of vehicle information, any faults or DTCs in these related systems can prohibit proper surround vision operation.

If equipped, the video processing control module system may have a memory card receptacle (with XVR) located in the trunk. The memory card receptacle interfaces with the video processing control module via a USB cable. The memory card receptacle also receives fused battery voltage and ground from the video processing control module. The video processing control module uses the memory card as a mass storage device, similar to a USB storage device.

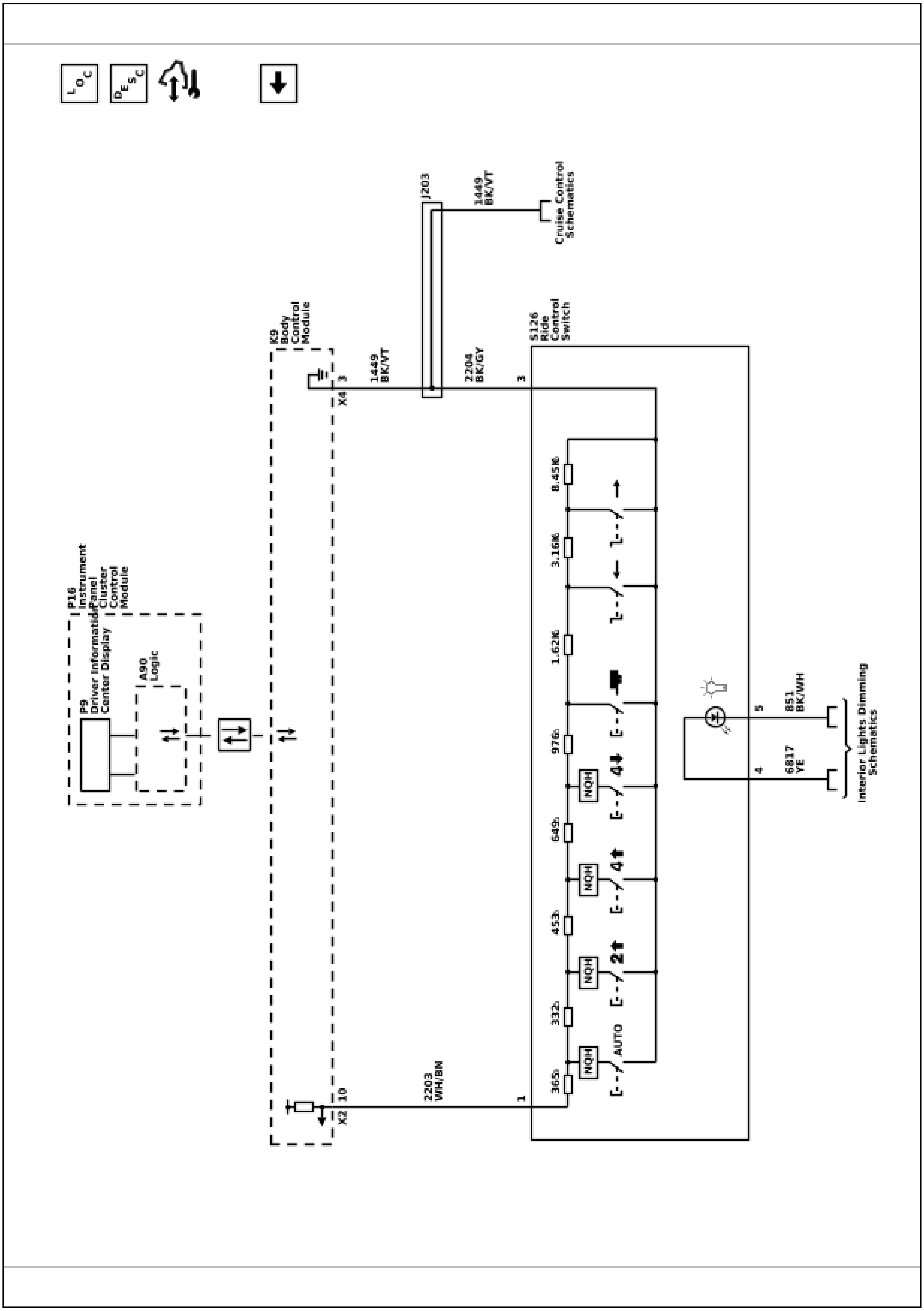
Secondary and Configurable Customer Controls

Schematic and Routing Diagrams

Steering Wheel Secondary/Configurable Control Schematics (Steering Wheel Radio Controls (UK3))


6846241
S70R Radio Control Switch - Steering Wheel
A90 Logic
3894 BK/BU
P16 Instrument Panel Cluster Control Module
A90 Logic
4314 GN/RD
4315 OG/RD
4312 BU/RD
4313 BU/RD
6051 BK
S70F Radio Volume Switch - Steering Wheel
S70E Radio Favorites Switch - Steering Wheel
G201
B+
1
3
11
10
8
7
6
2
3
1
5140 GN
J222
S70L Cruise Control Switch
12V
X51R Instrument Panel Wiring Harness Junction Block - Right
F17DR 2A
X2 41
5140 RD/GN
X85 Steering Wheel Airbag Coil
X1 14
X2 16

Steering Wheel Secondary/Configurable Control Schematics (Drive Mode Select Switch (URC))



L O C
D E S C
J203
1449 BK/VT
Cruise Control Schematics
K9 Body Control Module
X4 3
1449 BK/VT
2204 BK/GY
3
S126 Ride Control Switch
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
8.45K
3.16K
1.62K
976
649
453
332
365
NQH
4
2
AUTO
5
851 BK/WH
4
6817 YE
Interior Lights Dimming Schematics
X2 10
2203 WH/BN
1

6846242

Description and Operation

Steering Wheel Controls Description and Operation

The steering wheel control switches duplicate the function of the primary controls of the associated component, through a network of momentary contact switches.

The steering wheel controls are divided into a right-hand set and left-hand set. The switches are connected to a dedicated LIN data circuit.

- The S70E Radio Favorites Switch-Steering Wheel controls the favorites function of the radio.
- The S70F Radio Volume Switch-Steering Wheel allows for volume control of the radio.
- The S70L Cruise Control Switch consists of various cruise control specific functions including cruise on/off functions.
- The S70R Radio Control Switch controls various audio, communication and vehicle systems

Refer to the owners manual for more detailed operation of each steering wheel switch.

Steering Wheel Control Components

S70E Radio Favorites Switch-Steering Wheel

The S70E Radio Favorites Switch-Steering Wheel is a momentary contact switch located on the left rear side of the steering wheel. The S70E Radio Favorites Switch-Steering Wheel has two dedicated 5V Reference circuits for each switch function, the 5V Reference circuits come directly from the S70R Radio Control Switch. When a switch is depressed the signal is sent to the S70R Radio Control Switch that outputs a request through the LIN serial data circuit to perform the requested function.

S70F Radio Volume Switch-Steering Wheel

The S70F Radio Volume Switch-Steering Wheel is a momentary contact switch located on the right rear side of the steering wheel. The S70F Radio Volume Switch-Steering Wheel has two dedicated 5V Reference circuits for each switch function, the 5V Reference circuits come directly from the S70R Radio Control Switch. When a switch is depressed the signal is sent to the S70R Radio Control Switch that outputs a request through the LIN serial data circuit to perform the requested function.

S70L Cruise Control Switch

The S70L Cruise Control Switch is a resistive ladder design located on the left side of the steering wheel, each control function button having a different resistance value. The S70L Cruise Control Switch has its own 5V reference circuit from the BCM. The BCM detects a specific voltage value that is associated with the cruise control function switch being activated and sends the appropriate serial data message to complete the request.

For information on Cruise Control, refer to *Cruise Control Description and Operation 6-4*

S70R Radio Control Switch - Steering Wheel

The S70R Radio Control Switch is a set of momentary contact switches located on the right side of the steering wheel. When a switch is depressed the signal is grounded, the S70R Radio Control Switch sends a request through the LIN serial data circuit to the A11 Radio to perform the requested function.

Section 6

Engine/Propulsion

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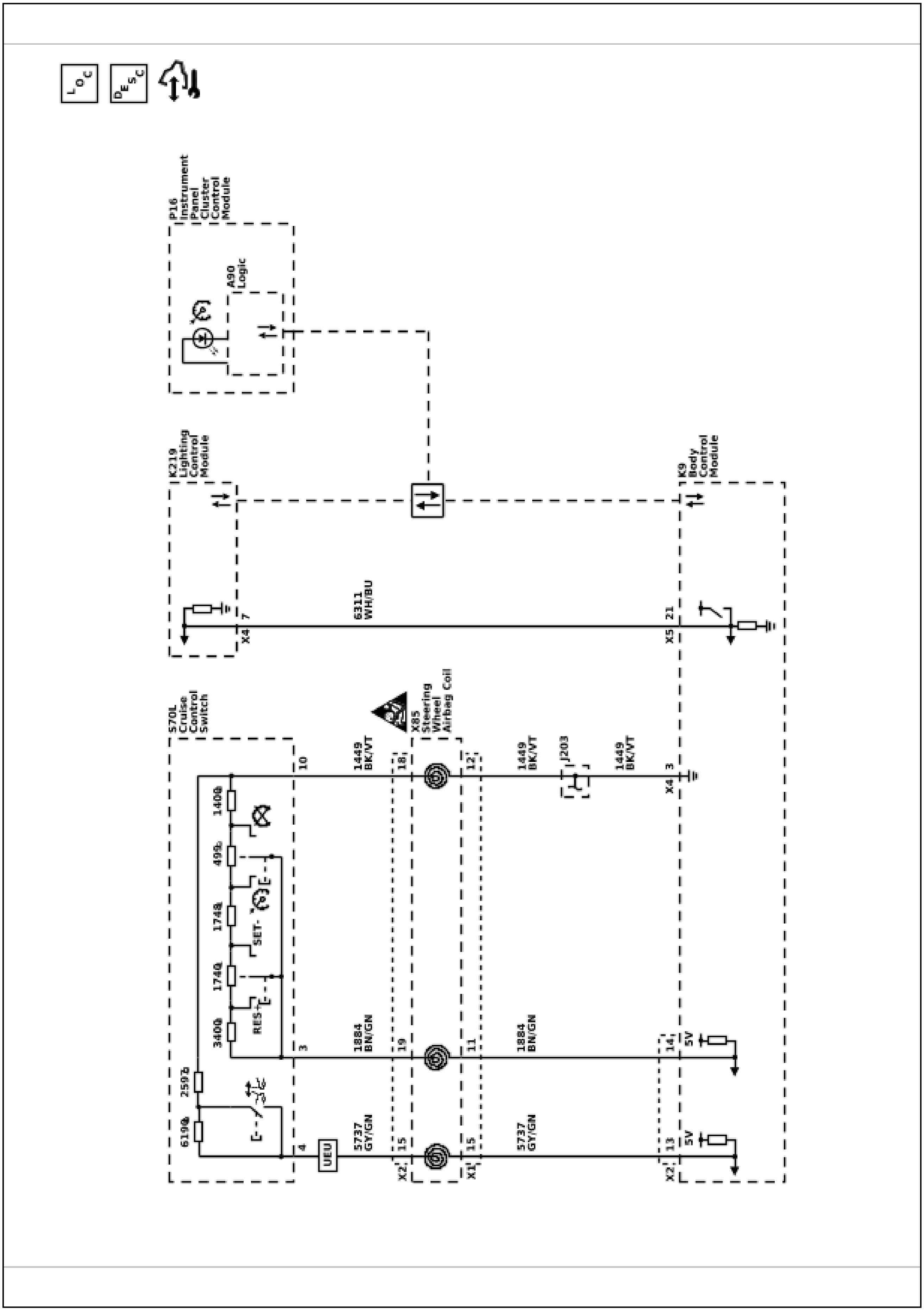
Engine/Propulsion

Cruise Control

Schematic and Routing Diagrams

Cruise Control Schematics (Cruise Control (K34))


6846251
L O C
D E S C
P16 Instrument Panel Cluster Control Module
A90 Logic
K219 Lighting Control Module
K9 Body Control Module
S70L Cruise Control Switch
X85 Steering Wheel Airbag Coil
X4 7
6311 WH/BU
X5 21
140Ω
49Ω
174Ω
174Ω
340Ω
259Ω
619Ω
SET-
RES+
10
3
4
UEU
1449 BK/VT
1884 BN/GN
5737 GY/GN
X2 18
X2 19
X2 15
X1 12
X1 11
X1 15
J203
X4 3
X2 14
X2 13
5V
5V

Description and Operation

Cruise Control Description and Operation

Note: If the vehicle is equipped with RPO KSG, it also has Adaptive Cruise Control. Refer to the Object Detection or the Driver Assistance Systems subsection for schematics, diagnostics, and description and operation related to Adaptive Cruise Control functions.

Cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions at speeds above 40 km/h (25 mph). Steep grades may cause variations in the selected vehicle speeds.

The following are the main components of the Cruise Control System:

- The accelerator pedal
- The brake pedal position (BPP) sensor
- The body control module (BCM)
- The cruise on/off switch
- The cruise control cancel switch
- The + RES switch (equivalent to resume/accelerate switch)
- The − SET switch (equivalent to set/coast switch)
- The engine control module (ECM)
- The throttle actuator control (TAC) motor (gasoline engines only)
- The vehicle speed sensor

The body control module (BCM) monitors the signal circuit of the cruise control switches, which are located on the steering wheel. The BCM relays the cruise control switch status to the engine control module (ECM) via the serial data circuit. The ECM uses the status of the cruise control switch to determine when to capture and maintain the vehicle speed. The ECM monitors the vehicle speed signal circuit in order to determine the desired vehicle speed.

Voltage is supplied to the cruise control switch via the steering wheel control switch reference voltage circuit supplied by the BCM. The cruise control function switches are arranged in a resistive ladder design, with each cruise control function switch having a different resistance value. The BCM detects a specific voltage value that is associated with the cruise control function switch being activated. The BCM sends a serial data message to the ECM indicating that the on/off switch is active. Similarly, when the normally open + RES switch or the normally open − SET switch are pressed, the switch closes and the BCM detects the predetermined voltage signal on the cruise control resume/accel and set/coast switch signal circuit. The BCM sends a serial data message to the ECM indicating that the + RES switch or the − SET switch is active.

Cruise Control Engaged

The Cruise Control System will engage and adjust vehicle speeds, based on the activation of the following cruise control switches, which are located on the steering wheel:

- On/Off
- + RES
- − SET

To engage the Cruise Control System, ensure that the vehicle speed is above 40.2 km/h (25 mph), turn the cruise On/Off switch ON and momentarily press the − SET switch. The ECM will engage the Cruise Control System and record the vehicle speed. The ECM sends a serial data message to the instrument panel cluster (IPC) in order to illuminate the Cruise Engaged indicator in the IPC. Refer to the vehicle owner’s manual for the location and operation of the cruise control On/Off indicators and driver information center (DIC) messages.

Pressing the accelerator pedal while the Cruise Control System is engaged, allows the driver to override the Cruise Control System in order to accelerate the vehicle beyond the current set vehicle speed. When the accelerator pedal is released, the vehicle will decelerate and resume the current set vehicle speed.

The driver can also override the current set vehicle speed via the − SET switch and the + RES switch. When the Cruise Control System is engaged, pressing and holding the − SET switch will allow the vehicle to decelerate from the current set vehicle speed without deactivating the Cruise Control System. When the − SET switch is released, the ECM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the Cruise Control System is engaged, momentarily pressing the − SET switch will allow the vehicle to decelerate at a vehicle specific calibratable increment, commonly 1 km/h or 1 mph, each time that the − SET is momentarily pressed, with a minimum vehicle speed of 38 km/h (24 mph). Refer to the vehicle Owner’s Manual for more information.

Pressing and holding the + RES switch, when the Cruise Control System is engaged, will allow the vehicle to accelerate to a greater vehicle speed than the current set vehicle speed. When the + RES switch is released, the ECM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the Cruise Control System is engaged, momentarily pressing the + RES switch will allow the vehicle to accelerate at a vehicle specific calibratable increment, commonly 1 km/h or 1 mph, each time that the + RES switch is momentarily pressed. Momentarily activating the + RES switch will recall the previous vehicle speed, after the cruise control system has been disengaged by pressing the brake pedal, or CANCEL switch. Refer to the vehicle Owner's Manual for more information.

Cruise Control Disengaged

The engine control module (ECM) disengages the cruise control operation based on the signals from the following switches:

- The brake pedal position (BPP) sensor
- The On/Off switch
- The cruise control cancel switch

The Cruise Control System will disengage when the brake pedal is applied. The body control module (BCM) monitors the BPP sensor via the BPP sensor signal circuit as the voltage signal increases while the pedal is further applied. The ECM monitors the BPP signal through a discrete input and a serial data message signal from the BCM indicating the brake status. When either signal indicates the brake pedal is applied, the ECM will disengage the cruise control system.

The Cruise Control System will also disengage when the cruise control on/off switch is switched OFF, or the cruise control cancel switch is activated. The body control module (BCM) determines when the cruise control cancel switch is activated. When the normally open cancel switch is closed, the BCM detects the predetermined voltage signal on the cruise control function switch circuit. The vehicle speed stored in the memory of the engine control module will be erased when the cruise control On/Off switch is turned OFF, or the ignition switch is turned OFF. The BCM sends a serial data message to the ECM in order to disengage the cruise control system. When the Cruise Control System has been disengaged, the ECM sends a serial message to the instrument panel cluster (IPC) in order to turn OFF the Cruise Engaged indicator.

Every time the Cruise Control System is disengaged, the ECM will keep track of the reason for system disengagement. The last 8 disengagement reasons will be recorded within the ECM memory. The scan tool will display the last 8 Cruise Disengage History parameters, in which one out of approximately 50 possible reasons will be displayed in each of these 8 parameters. For the disengagement reason to be displayed within the scan tool parameter the Cruise Control System is active and disengagement is requested.

When engagement of the system is requested but an engagement inhibit is present, the most recent inhibit reason is recorded in the ECM history. The scan tool will display the most recent inhibit reason, in which one out of approximately 50 possible reasons will be displayed.

Cruise Control Inhibited

The engine control module (ECM) inhibits the cruise control operation when any of the following conditions exist:

- The ECM has not detected a brake pedal activation from the body control module (BCM) this ignition cycle.
- A Cruise Control System DTC has been set.
- The vehicle speed is less than 38.6 km/h (24 mph).
- The vehicle speed is too high.
- The vehicle is in PARK, REVERSE, NEUTRAL, or 1st gear.
- The engine RPM is low.
- The engine RPM is high.
- The system voltage is not between 9 volts and 16 volts.
- The Antilock Brake System (ABS)/Traction Control System (TCS) is active for more than a calibratable time (typically 0.3 to 0.7 seconds).

Cruise Control Inhibit Reasons

This is a general list of inhibit reasons. Not every inhibit reason is applicable to all vehicles. Refer to the scan tool inhibit reason list for the last 8 reasons that have been recorded during the current ignition cycle.

Scan Tool Name	Description	Long Description
Acceleration Rate too High	High acceleration	The vehicle acceleration rate is too high.
TRAILER BRAKES APPLIED	Trailer brakes applied	The trailer brake system has been activated.

Scan Tool Name	Description	Long Description
Acceleration Time	Rate limiting fault	Cruise torque request rate limiting active too long.
Adaptive Cruise Control Configuration Incorrect	Adaptive cruise control option mismatch	The cruise control type (adaptive cruise or conventional cruise) is mismatched between the engine control module (ECM) and the body control module (BCM).
Antilock Braking System Active	Antilock Braking System Active	The antilock braking system was active. Only reported on enhanced cruise control vehicles.
Automatic Braking Engine Torque Request Signal Communication Malfunction	Automatic braking engine torque request signal communication malfunction	An engine control module to electronic brake control module (EBCM) serial data fault is active or communication has been lost between the modules.
Automatic Braking Malfunction	Brake system malfunction	The electronic brake control module has detected a failure that does not allow automatic braking to be performed.
Axle Torque Serial Communication Malfunction	Axle Torque Serial Communication Malfunction	The adaptive cruise control is being inhibited by the ECM because a serial data signal timeout error has occurred with the hybrid max/min torque signals.
Battery Voltage Too High	Voltage above high voltage threshold	The ignition voltage is too high at the engine control module (typically 18 volts).
Battery Voltage Too Low	Voltage below low voltage threshold	The ignition voltage is low at the engine control module (typically 9 volts).
Brake Pedal Applied	Brake pedal apply	The brake pedal was applied.
Brake Pedal Not Initialized	Brake before cruise	The brake pedal has not been seen as applied prior to driver request to engage cruise with set switch. A brake pedal apply must be seen before allowing cruise engagement during each key cycle. On a vehicle equipped with a manual transmission, a clutch pedal apply may satisfy the brake pedal apply criteria.
Brake Pedal Position Malfunction	Brake pedal position signal invalid	A brake pedal apply circuit fault has been detected.
Brake Pedal Position Signal Malfunction	DTC P0703 is active or maximum time elapsed without receiving a valid Brake Pedal Position signal.	A serial data fault is active or communication has been lost with the module sending the brake pedal apply state.
Brake Pedal Pressure Detected	Brake pedal driver applied pressure detected	A brake pedal apply has been detected based on brake pedal pressure as measured by the electronic brake control module.
Brake Pedal Released Position Not Learned	Brake apply sensor home position not learned	The brake pedal position sensor released position is not learned.
Brake System Malfunction	Adaptive cruise control automatic braking failed	Adaptive cruise control automatic braking inoperative.
Calculated Torque	Calculated engine torque	The engine torque calculation is incorrect.
Clutch Pedal Applied	Clutch switch active	The clutch pedal was applied.
Coast Below Minimum Speed	Coast below low speed inhibit	The Set/Coast switch was depressed and the vehicle slowed below the minimum cruise control operating speed.
Coast Mode	Coast disengage	Cruise control is in coast mode with the Set/Coast switch depressed and is requesting no throttle.
Control Function Active	DLC override	A scan tool is plugged into the Data Link Connector (DLC) connector.
Control Module Memory Malfunction	Memory failure	A control module memory failure has been detected.
Control Module Processor Malfunction	Processor integrity fault (random access memory corruption)	An engine control module software error has occurred.

Scan Tool Name	Description	Long Description
Crawl Mode Active	Crawl Mode Active	Crawl mode is active and inhibiting cruise control.
Cruise Control Cancel Switch Active	Cancel switch active	The cruise control cancel switch was depressed.
Cruise Control Software Malfunction	Sequence of completion checks	A cruise control software execution error has occurred.
Cruise Control Switch Inactive	On/Off switch in Off state	The cruise control On/Off switch is turned off.
Cruise Control Switch Invalid	Analog cruise switch input out of range	The cruise control switch voltage signal is in an invalid range.
Cruise Control Switch Serial Communication Malfunction	Serial data fault (cruise switch serial communication fault)	The cruise control switch serial data fault is active or communication has been lost with the module sending cruise control switch states.
Deceleration Rate Too High	High deceleration	The vehicle deceleration rate is too high.
Diagnostic Trouble Code (DTC) Set	Malfunction in PCM/ECM (DTC active)	A DTC is active or in history that inhibits cruise control operation.
Distance Sensing Cruise Control Brake Pedal Applied	Distance Sensing Cruise Control Brake Pedal Applied	Adaptive cruise control is being inhibited by the ECM because a brake pedal apply has occurred.
Distance Sensing Cruise Control Cancel Switch Active	Distance Sensing Cruise Control Cancel Switch Active	Adaptive cruise control is being inhibited by the ECM because the driver applied the cancel switch.
Distance Sensing Cruise Control Data	Serial data fault for adaptive cruise control throttle control and brake control signals sent by the distance sensing cruise control module	A distance sensing cruise control module serial data fault is active or communication has been lost between the distance sensing cruise control module and the engine control module.
Distance Sensing Cruise Control Inhibit	Distance sensing cruise control inhibited	The distance sensing cruise control system is inhibited.
Distance Sensing Cruise Control Invalid Engage	Distance Sensing Cruise Control Invalid Engage	Adaptive cruise control is being inhibited by the ECM because an invalid sequence of cruise control applies, brake pedal applies, or an invalid speed range has been detected.
Distance Sensing Cruise Control Off	Distance Sensing Cruise Control Off	Adaptive cruise control is being inhibited by the ECM because the driver has turned off the cruise on/off switch.
Distance Sensing Cruise Control Reduced Engine Power	Distance Sensing Cruise Control Reduced Engine Power	Adaptive cruise control is being inhibited by the ECM due to a fault resulting in “Reduced Engine Power”.
Driven Wheel Speed Higher Than Non Driven Wheel Speed	Driven wheel speed greater (wheel slip detection)	The driven wheel speed is greater than the non driven wheel speed (slip detection).
Engine Control Module	PCM/ECM inhibit (RAM corruption)	Engine control module internal communication error.
Engine Control Module (ECM) Reset	ECM running reset	An engine control module running reset has occurred.
Engine Overspeed Protection Active	Injectors disabled (engine overspeed fuel cut-off active)	Engine RPM limiter active with fuel cut off active.
Engine Overtemperature Protection Active	Engine metal overtemp active	The engine is over temperature. The engine is overheated.
Engine Run Time	Engine run time not elapsed	The engine has not been running long enough, typically five seconds.
Engine Speed	Engine speed too low or too high	The engine RPM is too low (near stall) or too high (near engine RPM fuel shutoff).
Excessive Accelerator Position Override	Pedal greater than cruise (override)	The driver has overridden cruise control set speed with accelerator pedal for greater than an allowable time.
1st Gear	First Gear	Transmission is engaged in 1st gear.

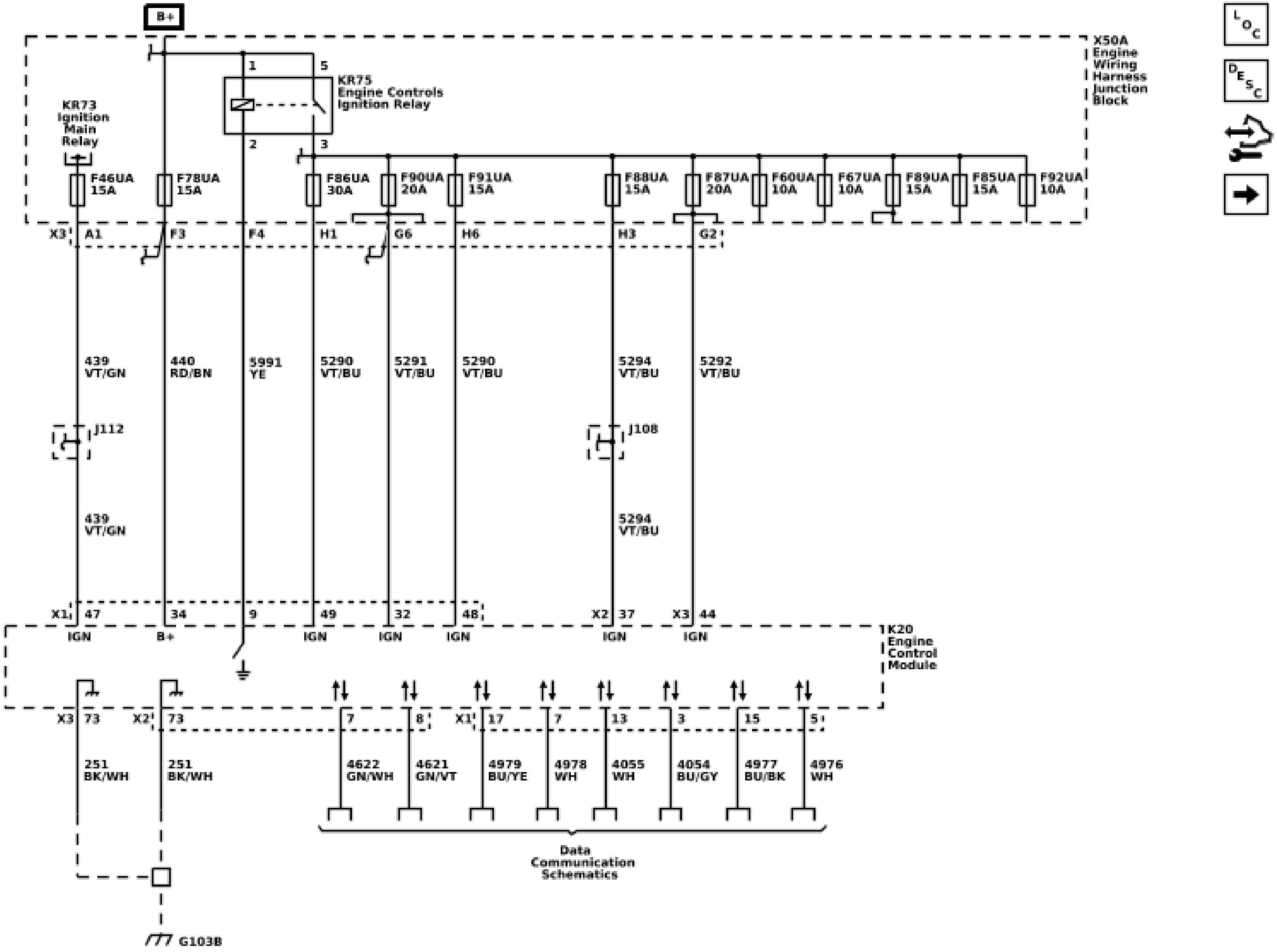
Scan Tool Name	Description	Long Description
Gear Change without Applied Clutch Pedal	Manual transmission out of gear with no clutch pedal apply	Manual transmission shifted to Neutral without clutch pedal being applied.
Hill Descent Control Active	Hill Descent Control System Active	The hill descent control system has gone active.
Hill Descent Control Serial Communication Malfunction	Hill Descent Control Serial Communication Malfunction	An electronic brake control module serial data fault is active or communication has been lost between the EBCM and ECM.
Hybrid/EV System	Hybrid Cruise Disengage	Cruise control is inhibited on hybrid applications when “Regen on Demand” is requested by the driver via the tap-up/tap-down paddles.
Illegal Mode	Illegal cruise mode	The cruise control mode is incorrect based on switch states.
Lane Center Control Serial Data Error	Lane Center Control Serial Communication Malfunction	Adaptive cruise control is being inhibited by the ECM because a serial data error has been detected on a vehicle with Lane Center Control.
Non Driven Wheel Speed Higher Than Drive Wheel Speed	Non-driven wheel speed greater	The non driven wheel speed is greater than the driven wheel speed.
None	None	This disengagement reason may be displayed after a dead battery repair or module replacement.
Park Brake Applied	Park brake switch signal active	The parking brake is applied.
Power Take-Off Active	Power Take Off active	The Power Take Off (PTO) system is active.
Rear Axle in Low Range	Rear axle in low	The rear axle is in low range.
Set/Coast and Resume/Accelerate Switches Active Simultaneously	SET and RESUME switches simultaneously active	The Set/Coast and Resume/Accelerate switches were pressed simultaneously.
Set/Coast Switch Active With Vehicle Speed Higher Than Set Point	Over schedule tap-down	The Set/Coast switch is selected, vehicle speed is above set speed and does not decrease. May be due to traveling down hill.
Speed Limiting/Warning System On	Speed limiter/warning On/Off switch turned on	Driver has turned on the Speed Limiter/Warning on/off switch. Cruise is disabled/inhibited and cruise on/off switch will be set to Off.
Throttle Actuator Control System	Electronic throttle control prevents cruise operation	The electronic throttle control system has detected a failure in the throttle control hardware.
Traction Control Active	Traction control active	The traction control system was active.
Traction Control System Malfunction	Traction Control System Malfunction	A fault is present in the traction control system.
Traction Control System Off	Traction Control System Off	The traction control system has been turned off by the driver.
Transfer Case in 4WD Low Range	Transfer case in 4WD Low	The transfer case is in low range.
Transmission Gear Ratio Malfunction	Transmission gear fault	A transmission DTC is active or in history, that inhibits cruise control operation.
Transmission Not in Forward Gear	Transmission in neutral, reverse or park	The transmission gear selector is not in a forward gear.
Vehicle Overspeed Protection Active	MPH limited fuel (vehicle overspeed fuel cut-off active)	The vehicle overspeed protection is active with fuel cut off active.
Vehicle Speed Higher Than Set Point	Over schedule	Vehicle speed has exceeded driver selected set speed by more than an allowable amount. This may occur while driving down a significant grade or driver overriding cruise while performing a passing maneuver.
Vehicle Speed Lower Than Set Point	Under schedule	The vehicle speed is below cruise control set speed by more than an allowable amount.
Vehicle Speed Too High	Vehicle speed exceeds high speed threshold	Vehicle speed has exceeded maximum cruise operating speed.

Scan Tool Name	Description	Long Description
Vehicle Speed Too Low	Vehicle speed drops below low speed threshold	Vehicle speed dropped below the cruise control minimum operating speed. May be due to hilly terrain and low vehicle speed. Manual transmission gear selection and engine torque may contribute to this disengagement reason.
Vehicle Stability System Active	Vehicle stability control active	The vehicle stability control system was active.
Vehicle Stability System Malfunction	Vehicle Stability System Malfunction	A fault has been detected in the vehicle stability control system.
Vehicle Stability System Off	Vehicle Stability System Off	The vehicle stability control system has been turned off by the driver.

Engine Controls and Fuel - 6.6L

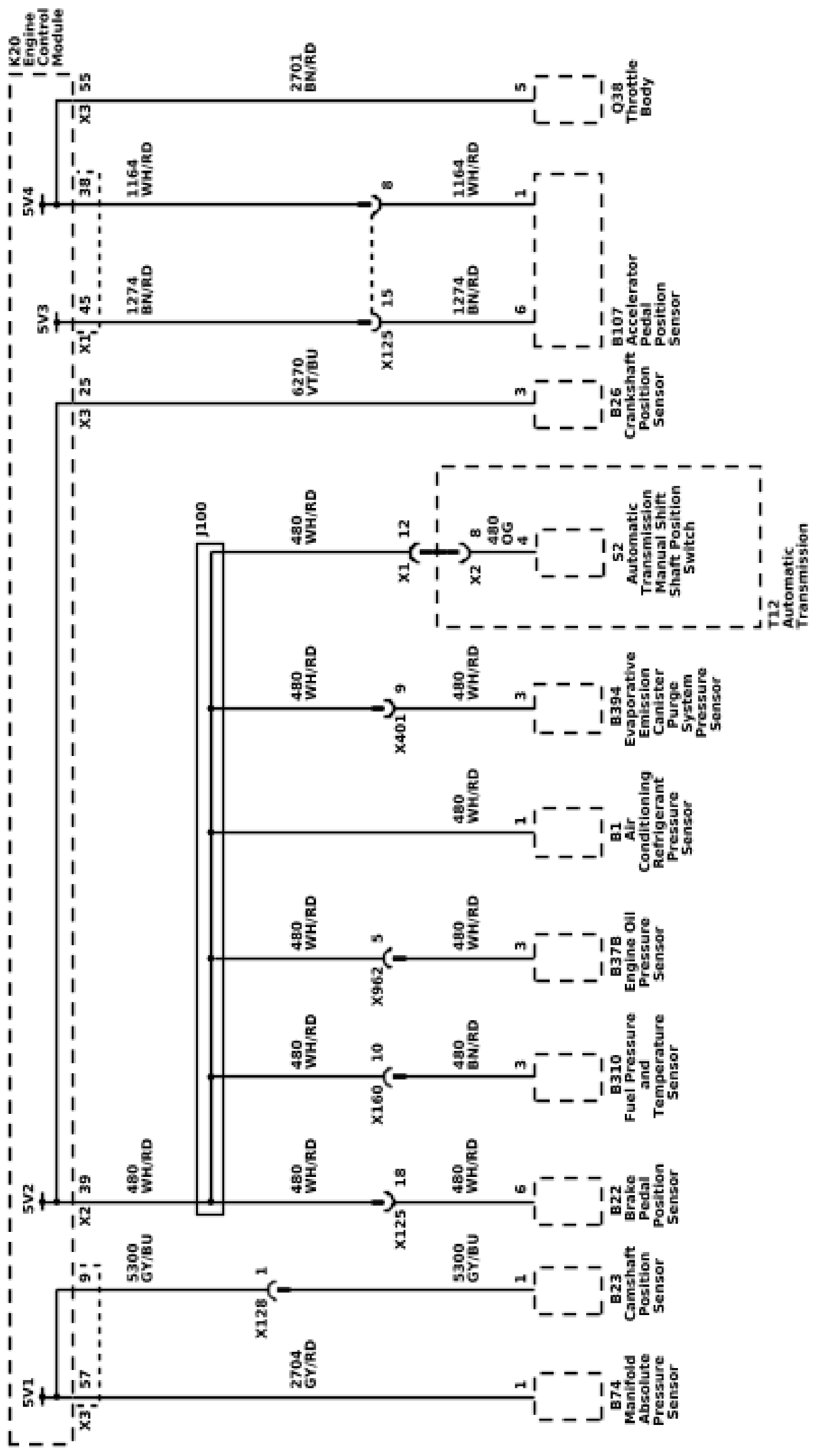
Schematic and Routing Diagrams

Engine Controls Schematics (Power, Ground, Serial Data and MIL)

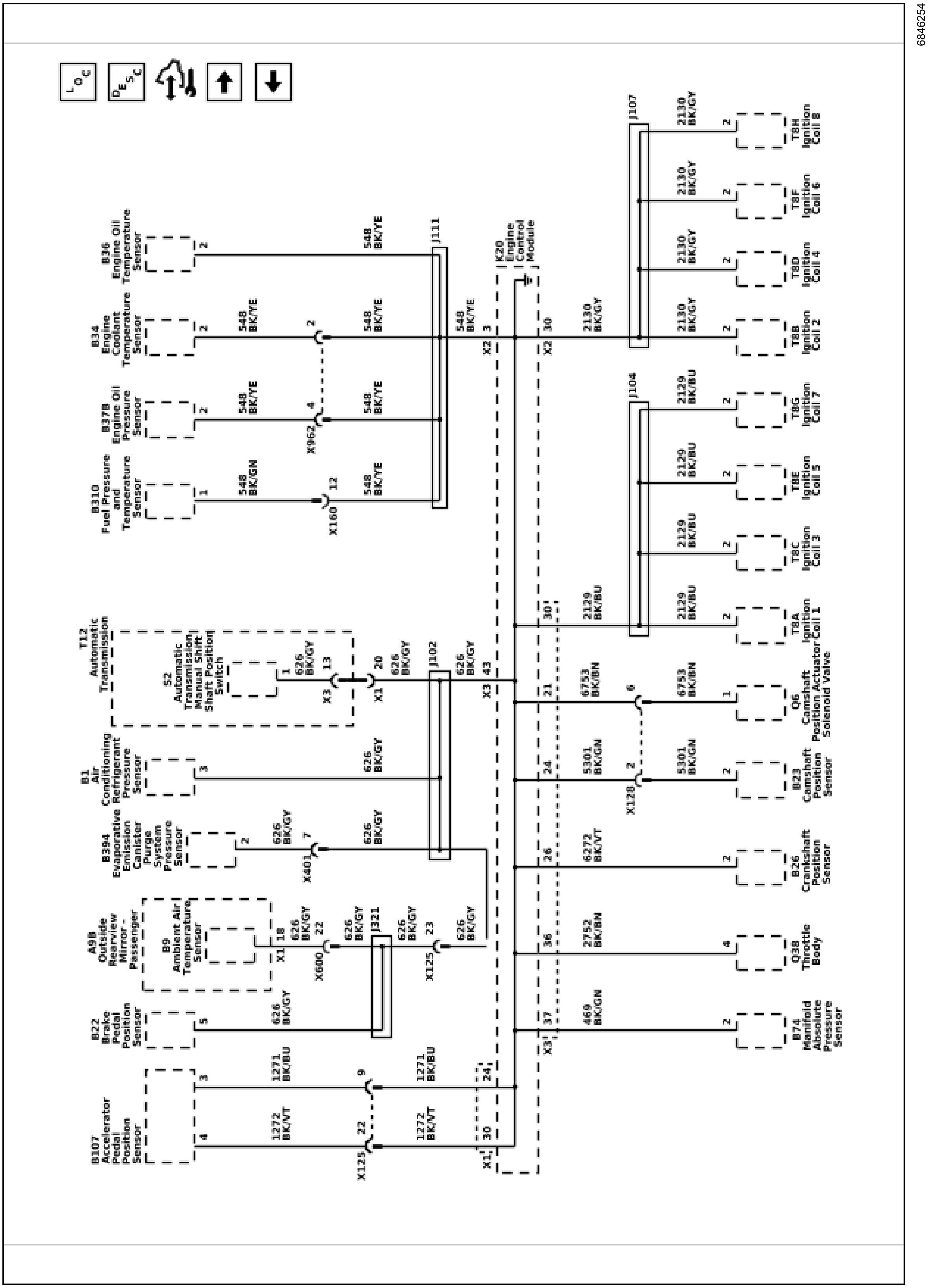

B+
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
KR75 Engine Controls Ignition Relay
1
5
2
3
F46UA 15A
F78UA 15A
F86UA 30A
F90UA 20A
F91UA 15A
F88UA 15A
F87UA 20A
F60UA 10A
F67UA 10A
F89UA 15A
F85UA 15A
F92UA 10A
X3
A1
F3
F4
H1
G6
H6
H3
G2
439 VT/GN
440 RD/BN
5991 YE
5290 VT/BU
5291 VT/BU
5290 VT/BU
5294 VT/BU
5292 VT/BU
J112
J108
439 VT/GN
5294 VT/BU
X1
47
34
9
49
32
48
X2
37
X3
44
IGN
B+
IGN
IGN
IGN
IGN
IGN
K20 Engine Control Module
X3
73
X2
73
7
8
X1
17
7
13
3
15
5
251 BK/WH
251 BK/WH
4622 GN/WH
4621 GN/VT
4979 BU/YE
4978 WH
4055 WH
4054 BU/GY
4977 BU/BK
4976 WH
Data Communication Schematics
G103B
LOC
DESC

6846252

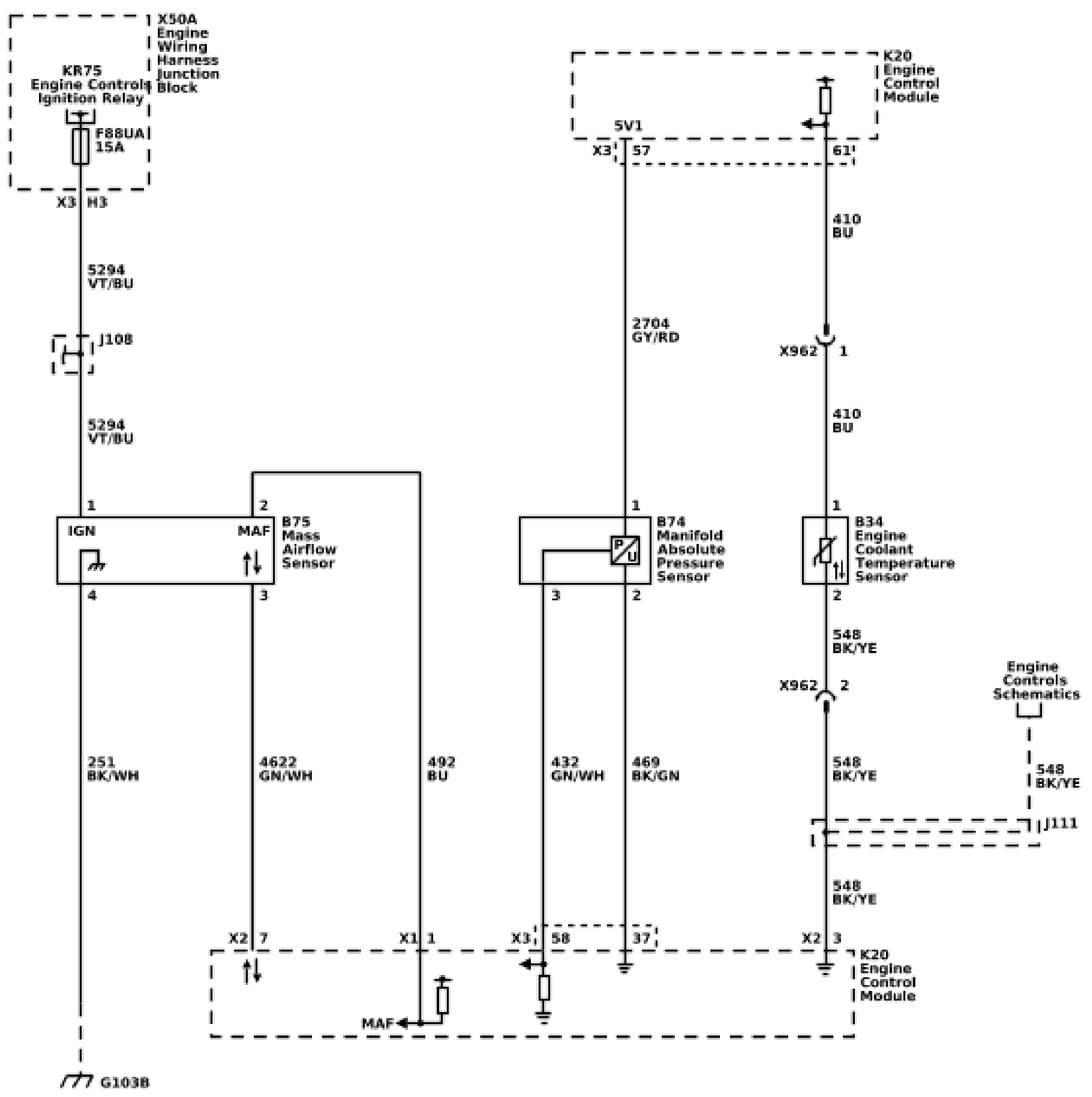
Engine Controls Schematics (5V Reference Bus)


6846253
K20 Engine Control Module
5V4
5V3
5V2
5V1
X3 55
X1 38
X1 45
X3 25
X2 39
X3 9
X3 57
2701 BN/RD
1164 WH/RD
1274 BN/RD
6270 VT/BU
480 WH/RD
5300 GY/BU
2704 GY/RD
J100
X125 8
X125 15
X1 12
X2 8
480 OG
4
X401 9
X962 5
X160 10
480 BN/RD
X125 18
X128 1
5
1
6
3
Q38 Throttle Body
B107 Accelerator Pedal Position Sensor
B26 Crankshaft Position Sensor
S2 Automatic Transmission Manual Shift Shaft Position Switch
T12 Automatic Transmission
B394 Evaporative Emission Canister Purge System Pressure Sensor
B1 Air Conditioning Refrigerant Pressure Sensor
B378 Engine Oil Pressure Sensor
B310 Fuel Pressure and Temperature Sensor
B22 Brake Pedal Position Sensor
B23 Camshaft Position Sensor
B74 Manifold Absolute Pressure Sensor

Engine Controls Schematics (Low Reference Bus)

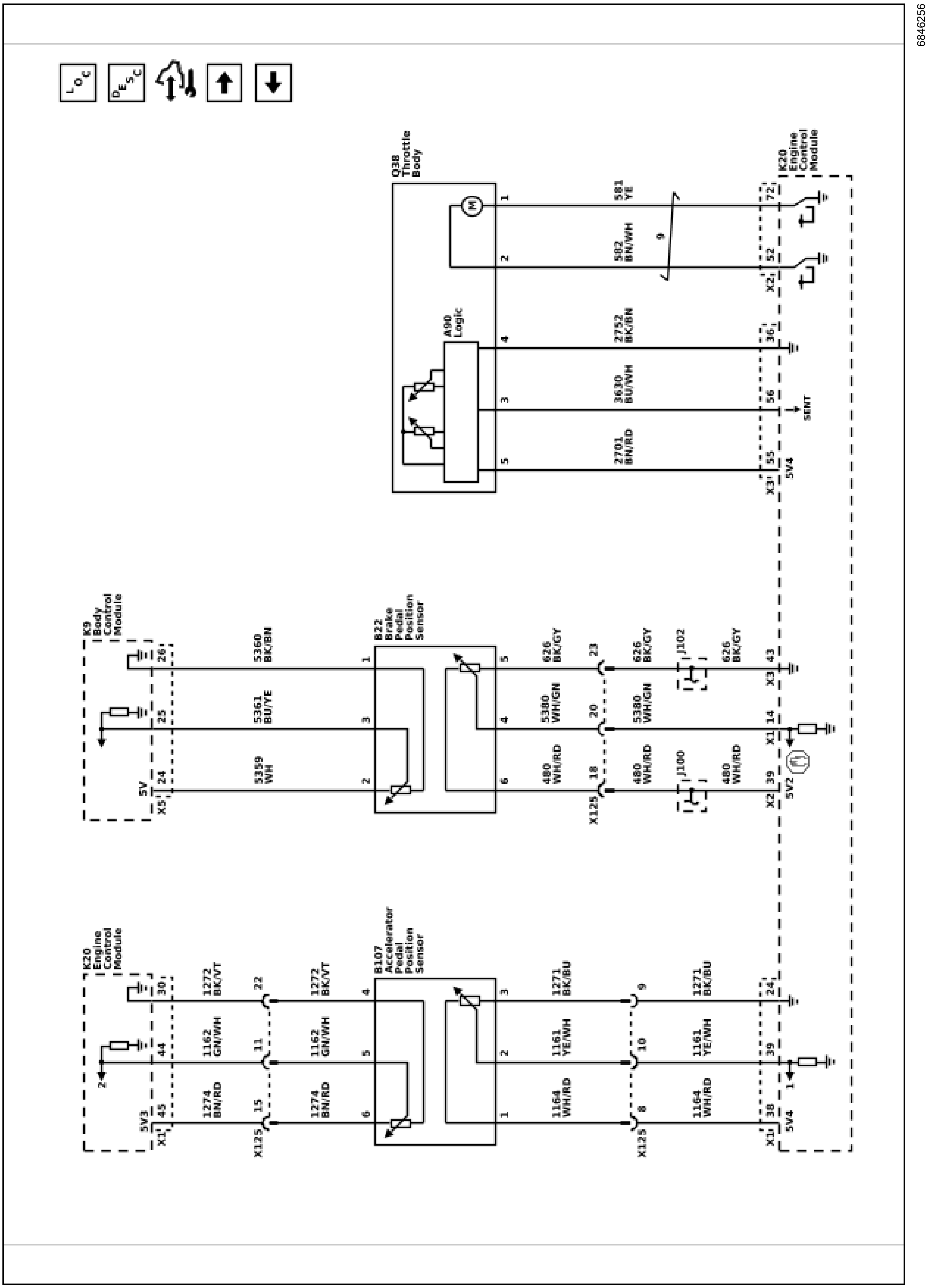

6846254
LOC
DESC
B36 Engine Oil Temperature Sensor
B34 Engine Coolant Temperature Sensor
B378 Engine Oil Pressure Sensor
B310 Fuel Pressure and Temperature Sensor
T12 Automatic Transmission
S2 Automatic Transmission Manual Shift Shaft Position Switch
B1 Air Conditioning Refrigerant Pressure Sensor
B394 Evaporative Emission Canister Purge System Pressure Sensor
A9B Outside Rearview Mirror - Passenger
B9 Ambient Air Temperature Sensor
B22 Brake Pedal Position Sensor
B107 Accelerator Pedal Position Sensor
548 BK/YE
548 BK/GN
626 BK/GY
1271 BK/BU
1272 BK/VT
J111
J102
J321
X962
X160
X401
X600
X125
X1
X2
X3
K20 Engine Control Module
2130 BK/GY
2129 BK/BU
6753 BK/BN
5301 BK/GN
6272 BK/VT
2752 BK/BN
469 BK/GN
J107
J104
X128
T8H Ignition Coil 8
T8F Ignition Coil 6
T8D Ignition Coil 4
T8B Ignition Coil 2
T8G Ignition Coil 7
T8E Ignition Coil 5
T8C Ignition Coil 3
T8A Ignition Coil 1
Q6 Camshaft Position Actuator Solenoid Valve
B23 Camshaft Position Sensor
B26 Crankshaft Position Sensor
Q38 Throttle Body
B74 Manifold Absolute Pressure Sensor

Engine Controls Schematics (Engine Data Sensors - Pressure and Temperature)

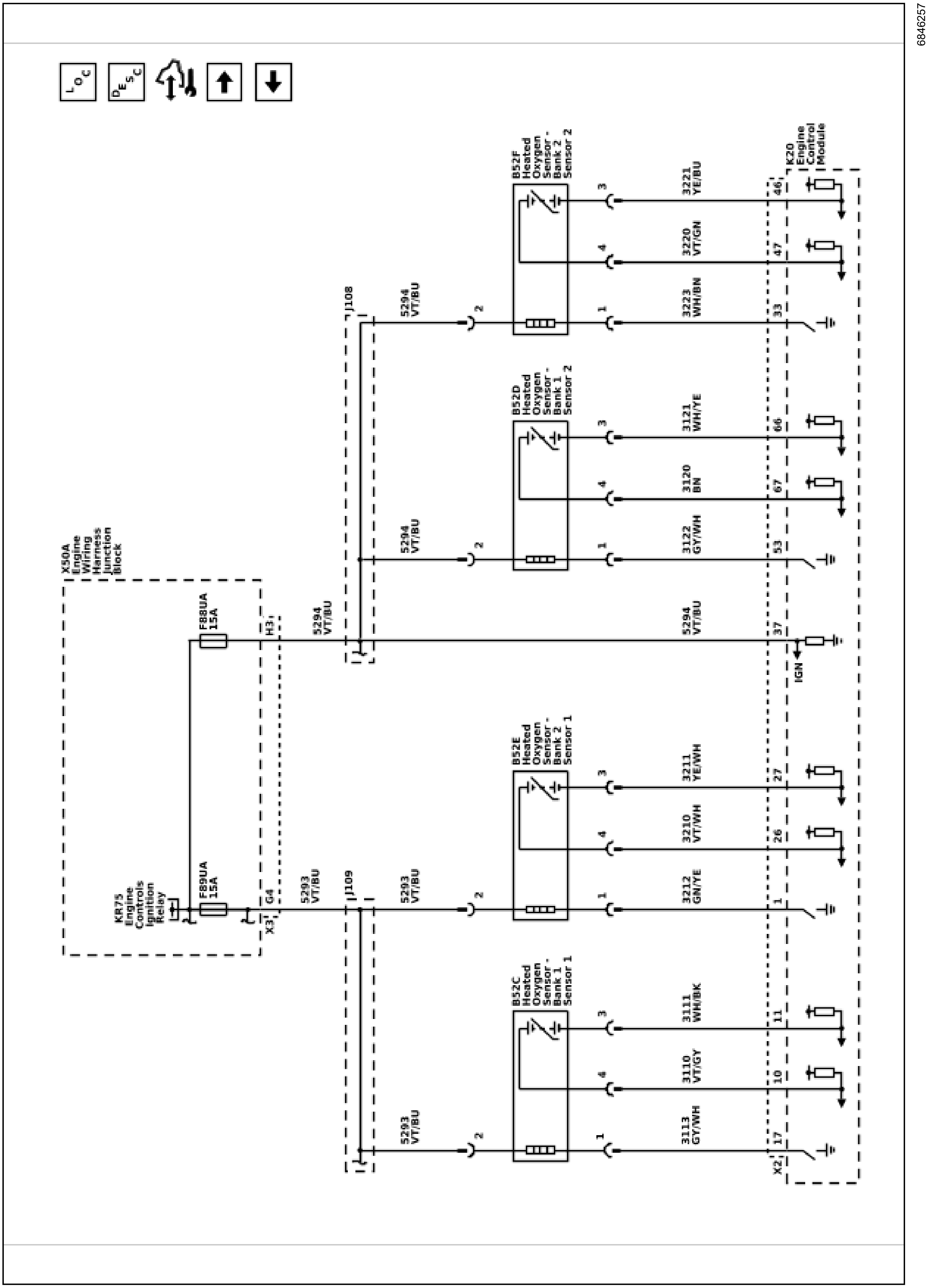

X50A Engine Wiring Harness Junction Block
KR75 Engine Controls Ignition Relay
F88UA 15A
X3 H3
5294 VT/BU
J108
5294 VT/BU
1
IGN
MAF
2
B75 Mass Airflow Sensor
4
3
251 BK/WH
4622 GN/WH
492 BU
G103B
K20 Engine Control Module
5V1
X3 57
61
410 BU
2704 GY/RD
X962 1
410 BU
1
B74 Manifold Absolute Pressure Sensor
P
U
3
2
B34 Engine Coolant Temperature Sensor
548 BK/YE
X962 2
Engine Controls Schematics
548 BK/YE
548 BK/YE
J111
548 BK/YE
432 GN/WH
469 BK/GN
X2 7
X1 1
X3 58
37
X2 3
MAF
K20 Engine Control Module

6846255

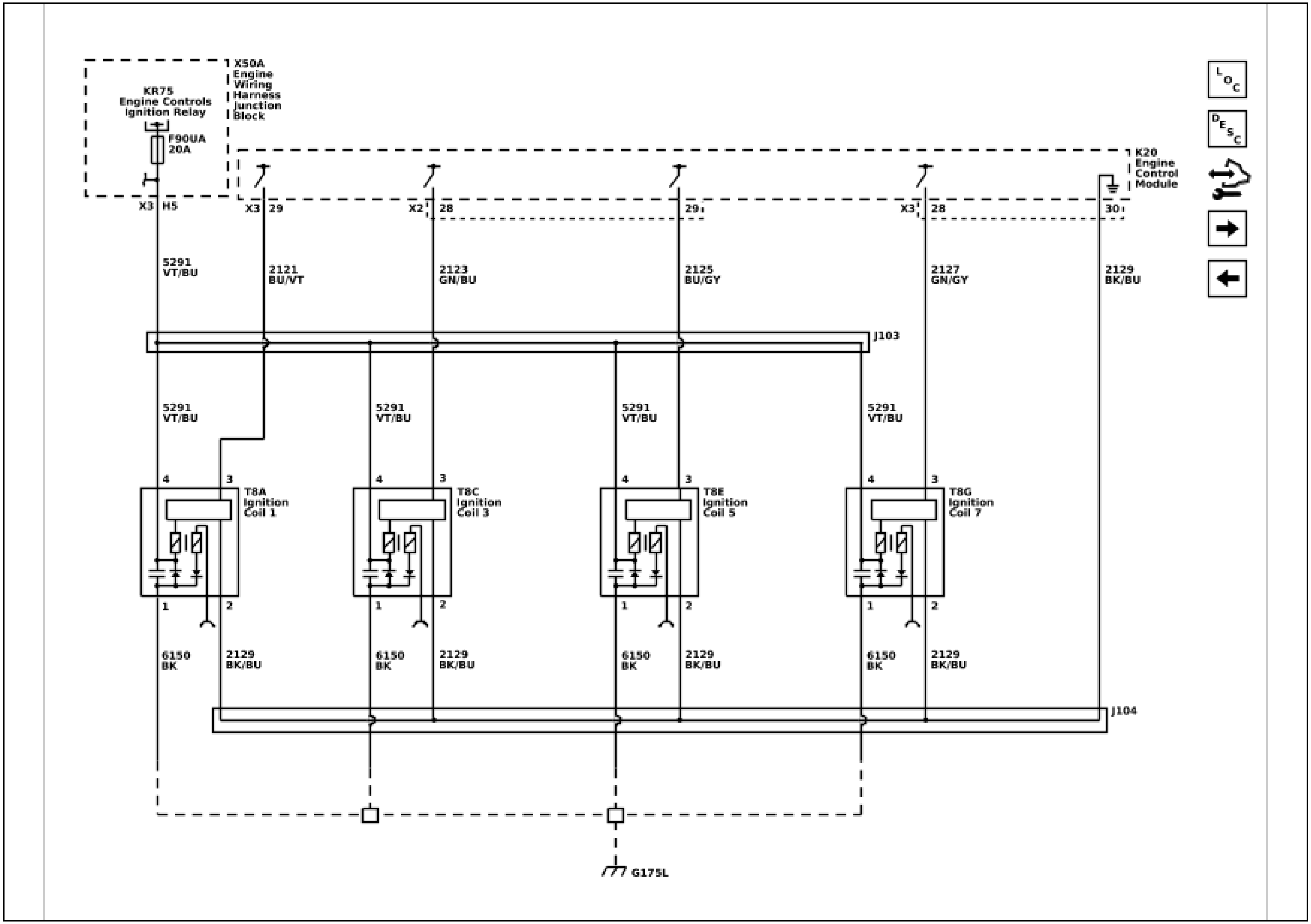
Engine Controls Schematics (Engine Data Sensors - Throttle Controls and Override)


6846256
K20 Engine Control Module
X1
5V3
45
44
30
2
1274 BN/RD
1162 GN/WH
1272 BK/VT
X125
15
11
22
B107 Accelerator Pedal Position Sensor
6
5
4
1
2
3
1164 WH/RD
1161 YE/WH
1271 BK/BU
X125
8
10
9
X1
38
39
24
5V4
1
K9 Body Control Module
X5
5V
24
25
26
5359 WH
5361 BU/YE
5360 BK/BN
B22 Brake Pedal Position Sensor
2
3
1
6
4
5
480 WH/RD
5380 WH/GN
626 BK/GY
X125
18
20
23
J100
J102
X2
39
X1
14
X3
43
5V2
Q38 Throttle Body
M
A90 Logic
1
2
4
3
5
581 YE
582 BN/WH
9
2752 BK/BN
3630 BU/WH
2701 BN/RD
X2
72
52
X3
36
56
55
SENT
5V4
K20 Engine Control Module

Engine Controls Schematics (Engine Data Sensors - Oxygen Sensors)

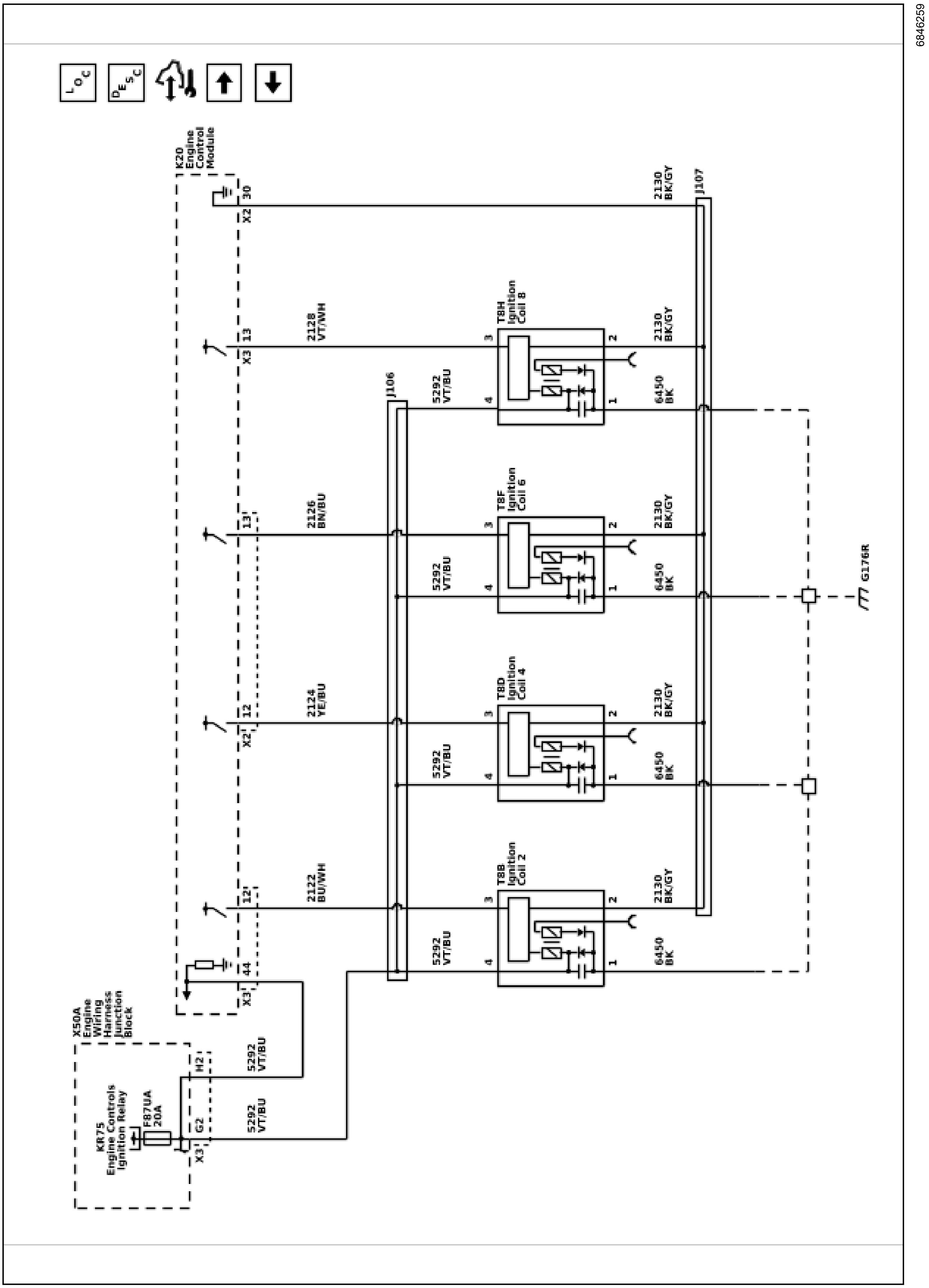

6846257
X50A Engine Wiring Harness Junction Block
KR75 Engine Controls Ignition Relay
F89UA 15A
F88UA 15A
X3
G4
H3
5293 VT/BU
5294 VT/BU
J108
J109
B52C Heated Oxygen Sensor - Bank 1 Sensor 1
B52E Heated Oxygen Sensor - Bank 2 Sensor 1
B52D Heated Oxygen Sensor - Bank 1 Sensor 2
B52F Heated Oxygen Sensor - Bank 2 Sensor 2
1
2
3
4
3113 GY/WH
3110 VT/GY
3111 WH/BK
3212 GN/YE
3210 VT/WH
3211 YE/WH
3122 GY/WH
3120 BN
3121 WH/YE
3223 WH/BN
3220 VT/GN
3221 YE/BU
X2
17
10
11
1
26
27
37
53
67
66
33
47
46
IGN
K20 Engine Control Module

Engine Controls Schematics (Ignition Controls - Ignition Coils Bank 1)

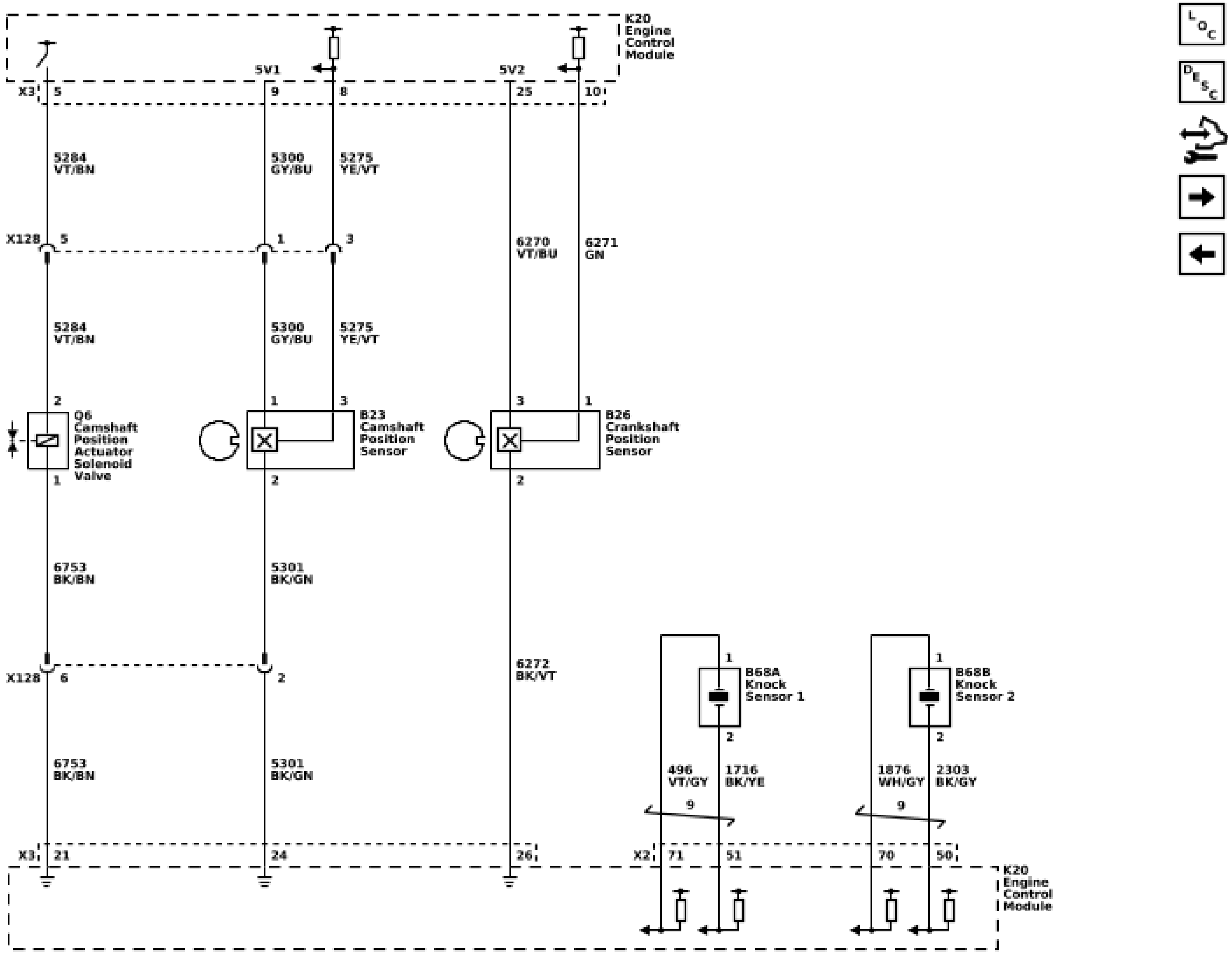

X50A
Engine
Wiring
Harness
Junction
Block
KR75
Engine Controls
Ignition Relay
F90UA
20A
X3 H5
K20
Engine
Control
Module
X3 29
X2 28
29
X3 28
30
5291
VT/BU
2121
BU/VT
2123
GN/BU
2125
BU/GY
2127
GN/GY
2129
BK/BU
J103
5291
VT/BU
5291
VT/BU
5291
VT/BU
5291
VT/BU
4
3
T8A
Ignition
Coil 1
4
3
T8C
Ignition
Coil 3
4
3
T8E
Ignition
Coil 5
4
3
T8G
Ignition
Coil 7
1
2
1
2
1
2
1
2
6150
BK
2129
BK/BU
6150
BK
2129
BK/BU
6150
BK
2129
BK/BU
6150
BK
2129
BK/BU
J104
G175L
LOC
DESC

6846258

Engine Controls Schematics (Ignition Controls - Ignition Coils Bank 2)

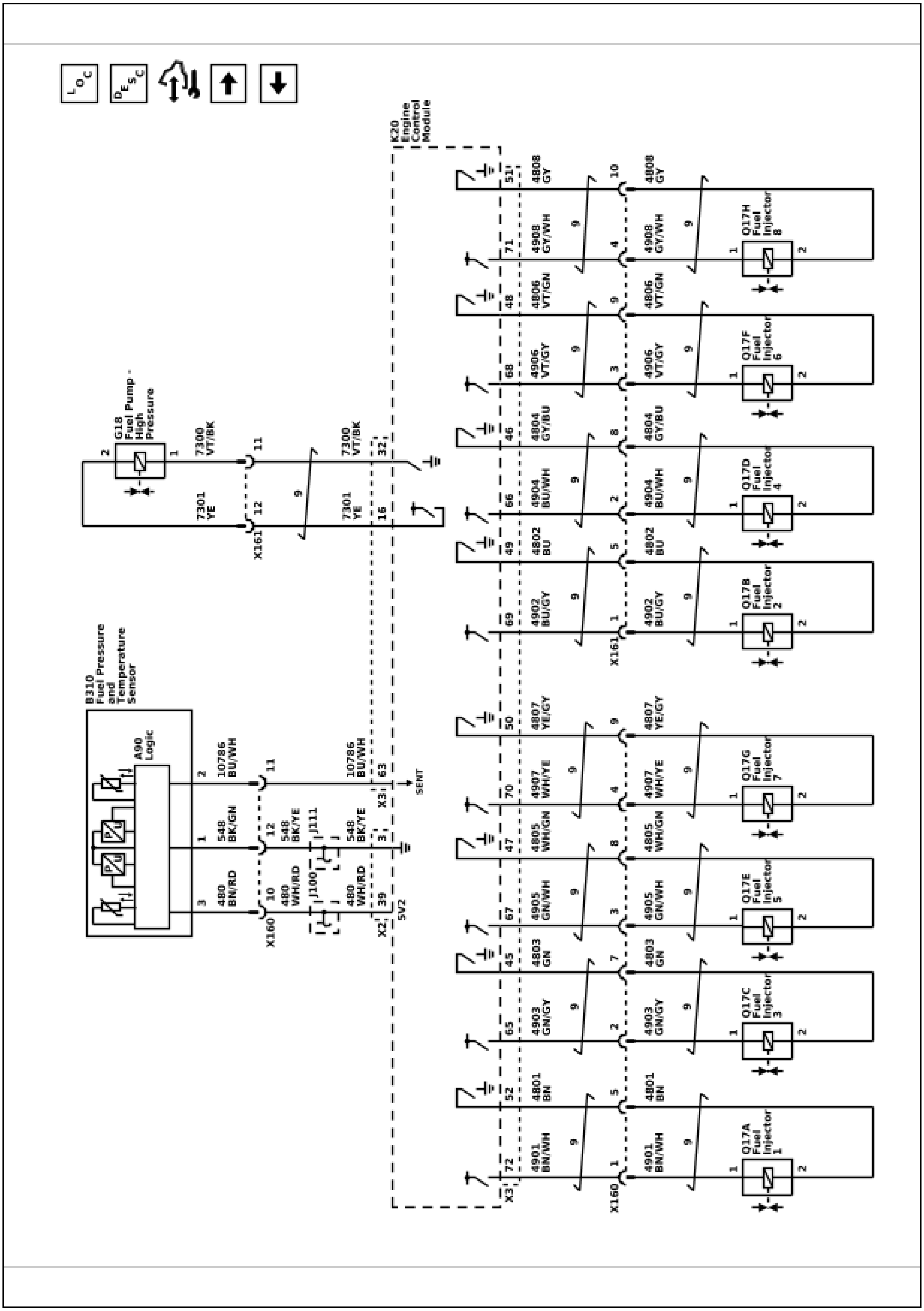

6846259
LOC
DESC
K20 Engine Control Module
X2 30
2130 BK/GY
J107
X3 13
2128 VT/WH
T8H Ignition Coil 8
3
4
2
1
5292 VT/BU
6450 BK
J106
13
2126 BN/BU
T8F Ignition Coil 6
G176R
X2 12
2124 YE/BU
T8D Ignition Coil 4
12
2122 BU/WH
T8B Ignition Coil 2
X3 44
X50A Engine Wiring Harness Junction Block
H2
G2
X3
KR75 Engine Controls Ignition Relay
F87UA 20A

Engine Controls Schematics (Ignition Controls - Crank Shaft Position, Camshaft Position, Knock Sensors and Camshaft Position Actuator)

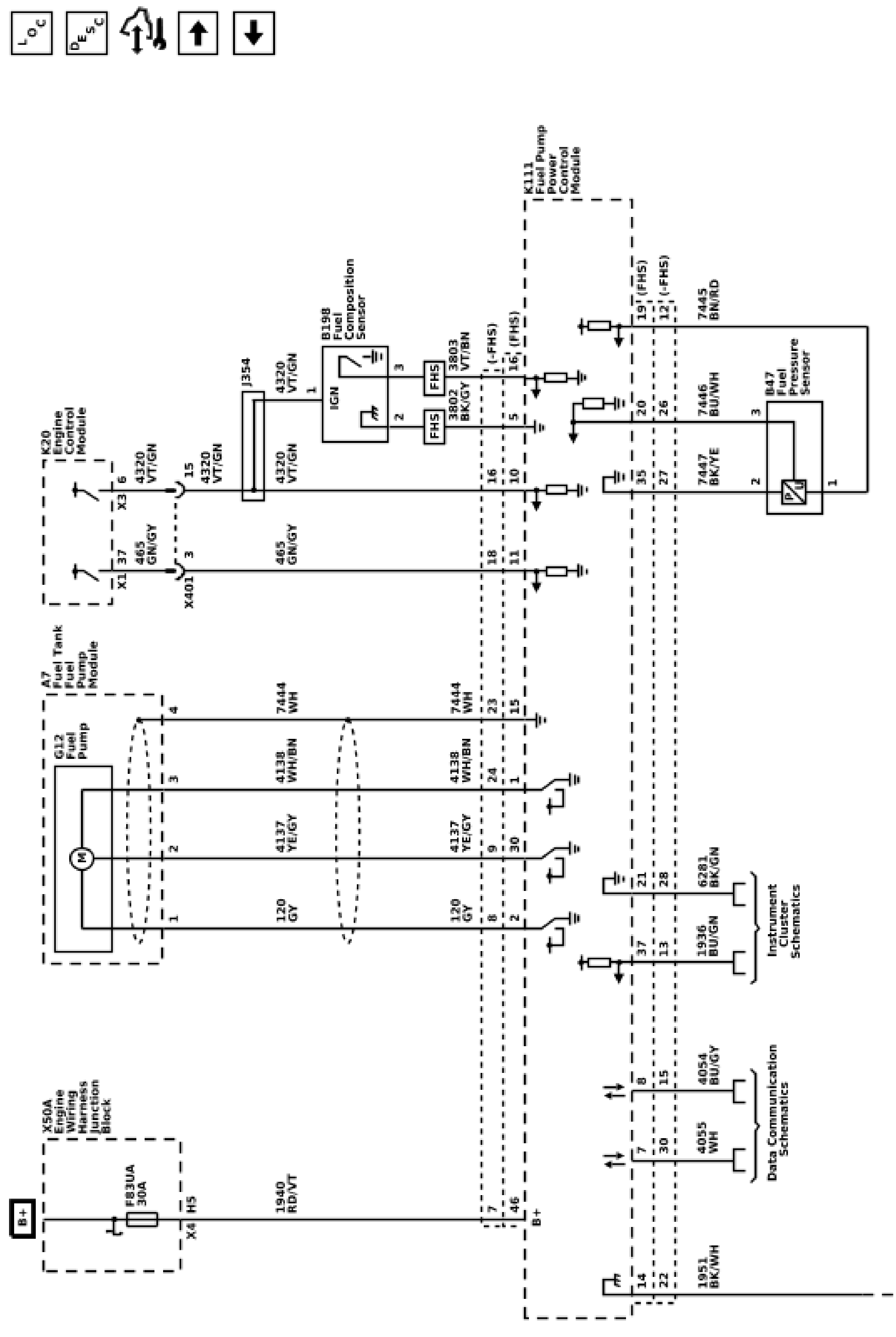

K20 Engine Control Module
5V1
5V2
X3
5
9
8
25
10
5284 VT/BN
5300 GY/BU
5275 YE/VT
X128
5
1
3
6270 VT/BU
6271 GN
5284 VT/BN
5300 GY/BU
5275 YE/VT
2
Q6 Camshaft Position Actuator Solenoid Valve
1
1
3
B23 Camshaft Position Sensor
2
3
1
B26 Crankshaft Position Sensor
2
6753 BK/BN
5301 BK/GN
6272 BK/VT
X128
6
2
6753 BK/BN
5301 BK/GN
1
B68A Knock Sensor 1
2
1
B68B Knock Sensor 2
2
496 VT/GY
1716 BK/YE
9
1876 WH/GY
2303 BK/GY
9
X3
21
24
26
X2
71
51
70
50
K20 Engine Control Module
L O C
D E S C

6846260

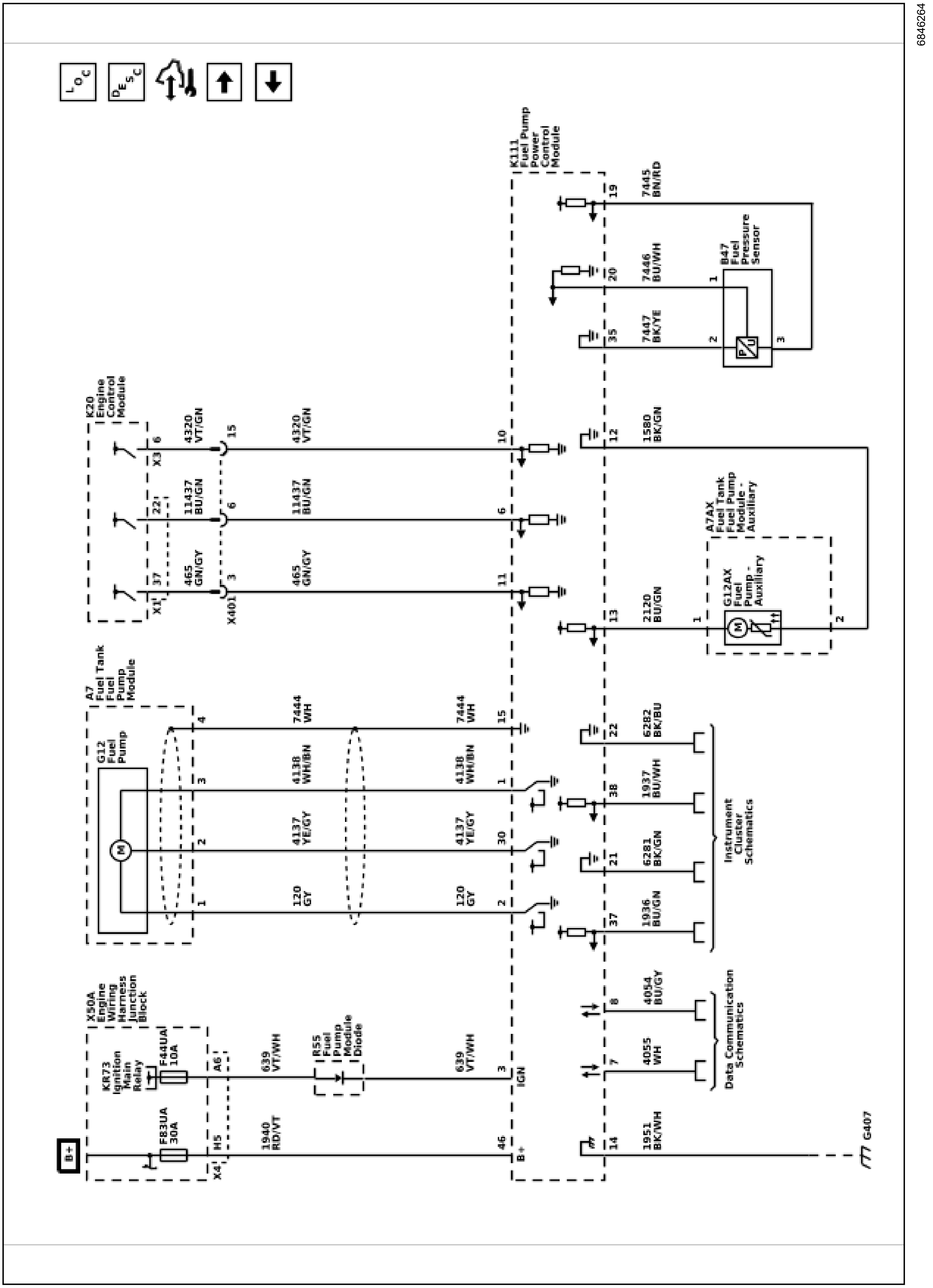
Engine Controls Schematics (Fuel Controls - Fuel Injectors)


6846261
K20 Engine Control Module
B310 Fuel Pressure and Temperature Sensor
A90 Logic
G18 Fuel Pump - High Pressure
10786 BU/WH
548 BK/GN
548 BK/YE
480 BN/RD
480 WH/RD
7300 VT/BK
7301 YE
J100
J111
X160
X161
X2
X3
SENT
5V2
Q17A Fuel Injector 1
Q17B Fuel Injector 2
Q17C Fuel Injector 3
Q17D Fuel Injector 4
Q17E Fuel Injector 5
Q17F Fuel Injector 6
Q17G Fuel Injector 7
Q17H Fuel Injector 8
4901 BN/WH
4801 BN
4903 GN/GY
4803 GN
4905 GN/WH
4805 WH/GN
4907 WH/YE
4807 YE/GY
4902 BU/GY
4802 BU
4904 BU/WH
4804 GY/BU
4906 VT/GY
4806 VT/GN
4908 GY/WH
4808 GY
72
52
65
45
67
47
70
50
69
49
66
46
68
48
71
51
63
39
32
16
9

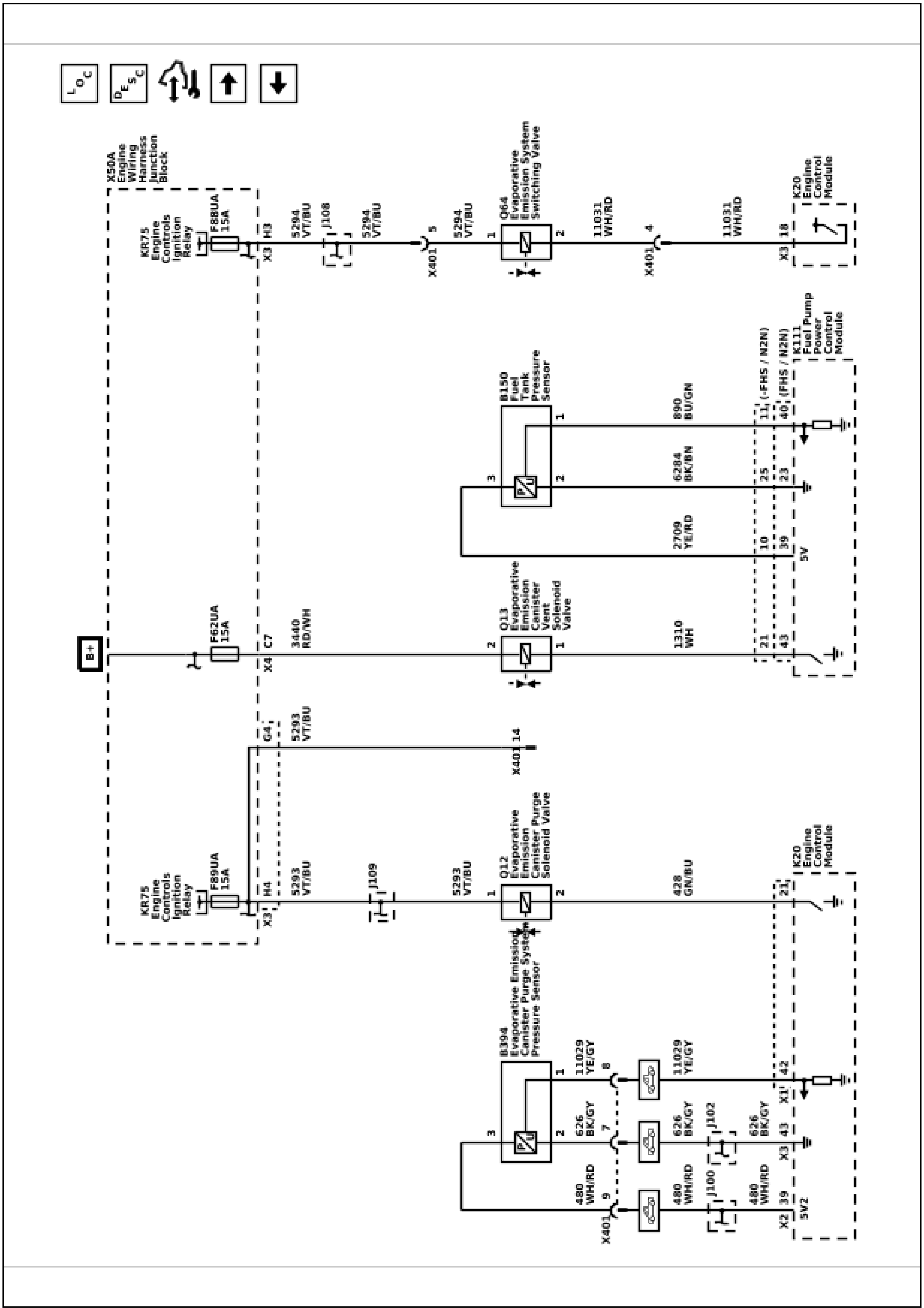
Engine Controls Schematics (Fuel Controls - Fuel Pump Control - Pickup)


6846262
B+
X50A Engine Wiring Harness Junction Block
F83UA 30A
X4 H5
1940 RD/VT
A7 Fuel Tank Fuel Pump Module
G12 Fuel Pump
M
1
2
3
4
120 GY
4137 YE/GY
4138 WH/BN
7444 WH
K20 Engine Control Module
X1 37
X3 6
465 GN/GY
4320 VT/GN
X401
3
15
J354
B198 Fuel Composition Sensor
IGN
3803 VT/BN
3802 BK/GY
FHS
(-FHS)
(FHS)
7
46
8
2
9
30
24
1
23
15
18
11
16
10
5
16
B+
K111 Fuel Pump Power Control Module
19 (FHS)
12 (-FHS)
7445 BN/RD
20
26
7446 BU/WH
35
27
7447 BK/YE
B47 Fuel Pressure Sensor
21
28
6281 BK/GN
37
13
1936 BU/GN
Instrument Cluster Schematics
8
15
4054 BU/GY
7
30
4055 WH
Data Communication Schematics
14
22
1951 BK/WH
G407

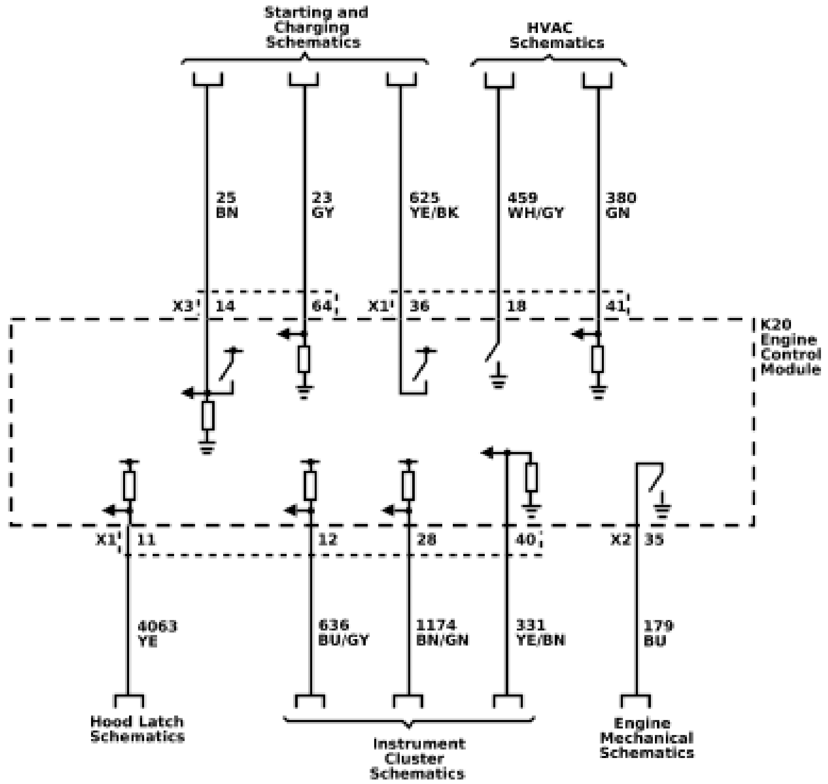
Engine Controls Schematics (Fuel Controls - Fuel Pump Control - Chassis Cab (N2N))


6846264
B+
F83UA 30A
KR73 Ignition Main Relay
F44UA 10A
X50A Engine Wiring Harness Junction Block
X4
H5
A6
1940 RD/VT
639 VT/WH
R55 Fuel Pump Module Diode
A7 Fuel Tank Fuel Pump Module
G12 Fuel Pump
1
2
3
4
120 GY
4137 YE/GY
4138 WH/BN
7444 WH
K20 Engine Control Module
X1
37
22
X3
6
465 GN/GY
11437 BU/GN
4320 VT/GN
X401
3
6
15
K111 Fuel Pump Power Control Module
46 B+
3 IGN
2
30
1
15
11
6
10
14
7
8
37
21
38
22
13
12
35
20
19
1951 BK/WH
G407
4055 WH
4054 BU/GY
Data Communication Schematics
1936 BU/GN
6281 BK/GN
1937 BU/WH
6282 BK/BU
Instrument Cluster Schematics
2120 BU/GN
1580 BK/GN
A7AX Fuel Tank Fuel Pump Module - Auxiliary
G12AX Fuel Pump - Auxiliary
7447 BK/YE
7446 BU/WH
7445 BN/RD
B47 Fuel Pressure Sensor

Engine Controls Schematics (Fuel Controls - Evaporative Emissions Controls)


6846265
LOC
DESC
X50A Engine Wiring Harness Junction Block
KR75 Engine Controls Ignition Relay
F88UA 15A
X3 H3
5294 VT/BU
J108
5294 VT/BU
X401 5
5294 VT/BU
Q64 Evaporative Emission System Switching Valve
1
2
11031 WH/RD
X401 4
11031 WH/RD
X3 18
K20 Engine Control Module
B150 Fuel Tank Pressure Sensor
1
2
3
890 BU/GN
6284 BK/BN
2709 YE/RD
11 (-FHS / N2N)
40 (FHS / N2N)
25
23
10
39
5V
K111 Fuel Pump Power Control Module
B+
F62UA 15A
X4 C7
3440 RD/WH
Q13 Evaporative Emission Canister Vent Solenoid Valve
2
1
1310 WH
21
43
G4
5293 VT/BU
X401 14
KR75 Engine Controls Ignition Relay
F89UA 15A
X3 H4
5293 VT/BU
J109
5293 VT/BU
Q12 Evaporative Emission Canister Purge Solenoid Valve
1
2
428 GN/BU
21
K20 Engine Control Module
B394 Evaporative Emission Canister Purge System Pressure Sensor
1
2
3
11029 YE/GY
8
11029 YE/GY
X1 42
626 BK/GY
7
626 BK/GY
J102
626 BK/GY
X3 43
480 WH/RD
X401 9
480 WH/RD
J100
480 WH/RD
X2 39
5V2

Engine Controls Schematics (Controlled/Monitored Subsystem References)


Starting and Charging Schematics
HVAC Schematics
25 BN
23 GY
625 YE/BK
459 WH/GY
380 GN
X3
14
64
X1
36
18
41
K20 Engine Control Module
X1
11
12
28
40
X2
35
4063 YE
636 BU/GY
1174 BN/GN
331 YE/BN
179 BU
Hood Latch Schematics
Instrument Cluster Schematics
Engine Mechanical Schematics

6846266

Description and Operation

Catalytic Converter Description and Operation

Three-Way Catalytic Converter

A three-way catalyst is designed to reduce the levels of hydrocarbons, carbon monoxide and nitrogen oxide.

Catalytic Converter

Catalyst Conversion
The catalyst within the converter promotes a chemical reaction, which oxidizes the hydrocarbons and the carbon monoxide that are present in the exhaust gas. This process converts the hydrocarbons and the carbon monoxide into water vapor and carbon dioxide, and reduces the nitrogen oxide, converting the nitrogen oxide into nitrogen.

Oxygen Storage
The catalyst stores oxygen. The engine control module (ECM) monitors this process by using heated oxygen sensors that are in the exhaust stream before and after the catalyst. The heated oxygen sensors produces an output signal that the ECM uses to calculate the oxygen storage capacity of the catalyst. This indicates the ability of the catalyst to convert the exhaust emissions efficiently. The ECM monitors the efficiency of the catalyst by monitoring the heated oxygen sensors during an off-idle, deceleration fuel cut-off event. When the catalyst is functioning properly, the post catalyst heated oxygen sensors response to the fuel conditions during the deceleration fuel cut-off event is slow compared to the response of the pre catalyst heated oxygen sensors. When the post heated oxygen sensors response is near that of the pre heated oxygen sensors, the oxygen storage capability and efficiency of the catalyst may be degraded below an acceptable threshold.

Cold Start Strategy
The catalyst must be warmed to efficiently reduce the emissions. The cold start strategy is to reduce the amount of time it takes to warm the catalyst. During a cold start, the engine spark timing and fuel injection are altered to allow the catalyst to warm quickly. The ECM monitors the following to build an exhaust energy model:

- Engine airflow
- Engine coolant temperature
- Engine idle speed
- Engine run time
- Fuel Injection
- Spark advance

The actual model is then compared to the expected exhaust energy model.

Fuel Trim Bias
Fuel trim bias is used to keep the post catalyst air/fuel ratio within a predetermined range. This allows optimal catalyst efficiency under various operating conditions. The ECM constantly monitors how lean or rich the fuel trim bias is commanded, to determine if the fuel trim bias is greater than a calibrated amount.

Heated Oxygen Sensor Description and Operation

The engine control module (ECM) controls a closed loop air/fuel metering system in order to provide the best possible combination of driveability, fuel economy, and emission control. The ECM monitors the heated oxygen sensor (HO2S) signal and adjusts the fuel delivery based on the signal while in closed loop operation. The short term fuel trim values change rapidly in response to the HO2S signal. These changes fine tune the engine fueling. The long term fuel trim values change in response to trends in the short term fuel trim. The long term fuel trim makes coarse adjustments to fueling in order to re-center and restore control to short term fuel trim.

Heated Oxygen Sensor

When the engine is started, the ECM operates in an Open Loop mode, ignoring the HO2S signal voltage while calculating the air-to-fuel ratio. While the engine runs, the HO2S heats up and begins to generate a voltage within a range of 0–1,000 mV. Once sufficient HO2S voltage fluctuation is observed by the ECM, Closed Loop mode is entered. The ECM uses the HO2S voltage to determine the air-to-fuel ratio. An HO2S voltage that increases toward 1,000 mV indicates a rich fuel mixture. An HO2S voltage that decreases toward 0 mV indicates a lean fuel mixture.

Heated oxygen sensors are used for fuel control and post catalyst monitoring. Each HO2S compares the oxygen content of the surrounding air with the oxygen content in the exhaust stream. The HO2S must reach operating temperature to provide an accurate voltage signal. A heating element inside the HO2S minimizes the time required for the sensor to reach operating temperature. This allows the system to enter Closed Loop earlier and the ECM to calculate the air-to-fuel ratio sooner. Voltage is provided to the heater by an ignition voltage circuit through a fuse. With the engine running, ground is provided to the heater by the HO2S heater low control circuit through a low side driver within the ECM. The ECM uses pulse width modulation (PWM) to control the HO2S heater operation to maintain a specific HO2S operating temperature range.

Wide Band Heated Oxygen Sensor

The wide band heated oxygen sensor (HO2S) measures the amount of oxygen in the exhaust system and provides more information than the switching style HO2S. The wide band sensor consists of an oxygen sensing cell, an oxygen pumping cell, and a heater. The exhaust gas sample passes through a diffusion gap between the sensing cell and the pumping cell. An electronic circuit within the ECM controls the pump current through the oxygen pumping cell in order to maintain a constant voltage in the oxygen sensing cell. The ECM monitors the voltage variation in the sensing cell and attempts to keep the voltage constant by increasing or decreasing the amount of current flow, or oxygen ion flow, from the pumping cell. By measuring the amount of current required to maintain the voltage in the sensing cell, the ECM can determine the concentration of oxygen in the exhaust. The HO2S pumping current is displayed as a lambda value. A lambda value of 1 is equal to a stoichiometric air fuel ratio of 14.7:1. Under normal operating conditions, the lambda value will remain around 1. When the fuel system is lean, the oxygen level will be high and the lambda signal will be high or more than 1. When the fuel system is rich, the oxygen level will be low, and the lambda signal will be low or less than 1. The ECM uses this information to maintain the correct air/fuel ratio. If the ECM detects that the HO2S signal is out of range a DTC will set.

The heating element inside each HO2S heats the sensor to bring it up to operating conditions faster. This allows the system to enter Closed Loop mode earlier and the ECM to calculate the air-to-fuel ratio sooner.

Inspection/Maintenance Description and Operation

Some state/provincial and local governments require that a vehicle pass on-board diagnostic (OBD) system tests and the Inspection/Maintenance (I/M) emission inspection in order to renew license plates. This is accomplished by viewing the I/M System monitors on a scan tool and confirming that no Permanent DTCs are set.

The OBD II system monitors all emission control systems that are on-board. The OBD II regulations require monitoring of the following:

Monitor	Diesel	Gasoline
Boost System Monitor - Since Diagnostic Trouble Codes Cleared	X	—
Catalytic Converter Monitor - Since Diagnostic Trouble Codes Cleared	X	X
Evaporative Emission Monitor - Since Diagnostic Trouble Codes Cleared	—	X
Exhaust Aftertreatment Monitor - Since Diagnostic Trouble Codes Cleared	X	—
Exhaust Gas Recirculation Valve/Camshaft Position Monitor - Since Diagnostic Trouble Codes Cleared	X	X
Exhaust Gas Sensor Monitor - Since Diagnostic Trouble Codes Cleared	X	—
Fuel System Monitor - Since Diagnostic Trouble Codes Cleared	X	X
Heated Catalytic Converter Monitor - Since Diagnostic Trouble Codes Cleared	—	X
Misfire Monitor - Since Diagnostic Trouble Codes Cleared	X	X
Oxygen Sensor Heater Monitor - Since Diagnostic Trouble Codes Cleared	—	X
Oxygen Sensor/Heated Oxygen Sensor Monitor - Since Diagnostic Trouble Codes Cleared	—	X
Particulate Filter Monitor - Since Diagnostic Trouble Codes Cleared	X	X

I/M System Status

Each system monitor requires at least one, and sometimes several diagnostic tests. The result of each test is reported by a DTC. A system monitor is Complete when either all of the DTCs comprising the monitor have run and passed, or when any one of the DTCs comprising the monitor has illuminated the malfunction indicator lamp (MIL). For example, when the Oxygen Sensor Heater Monitor indicates Complete, all of the oxygen sensor heaters have been diagnosed. If the vehicle has 4 heated oxygen sensors, all 4 heaters have been diagnosed.

Once the system monitor is complete, the I/M System Status parameter will display Complete in the value column of the scan tool. Any monitor that is not applicable to a vehicle will display Not Supported in the scan tool value column. The I/M System Status parameter will display Incomplete in the value column when any of the required tests for that system have not run. The following is a list of conditions that would set the I/M System Status monitor to Incomplete:

- The vehicle is new from the factory and has not yet been driven through the necessary drive conditions to complete the tests.
- The battery has been disconnected or discharged below operating voltage.

- The control module power or ground has been interrupted.
- The control module has been programmed.
- The control module DTCs have been cleared.

Permanent DTCs

Permanent DTCs are defined as confirmed fault codes that are currently commanding the MIL on and stored in non-volatile memory. Permanent DTCs cannot be erased by any scan tool command or by disconnecting power to the controller.

The intended use of this data is to prevent vehicles from passing an I/M inspection by disconnecting the battery or clearing codes with a scan tool prior to the inspection. The presence of Permanent DTCs at an inspection without the MIL illuminated is an indication that a proper repair was not verified by the OBD II system.

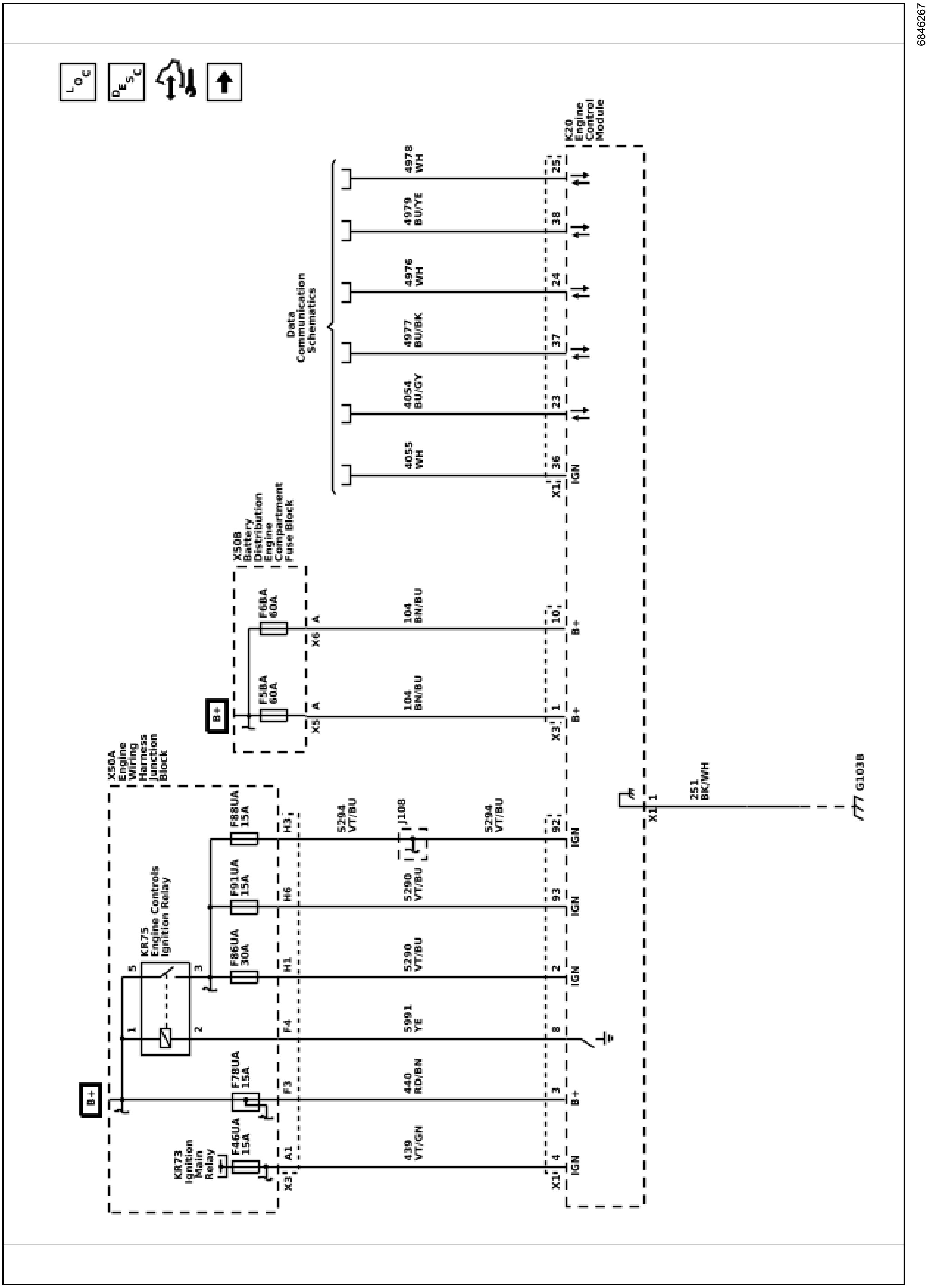
Only the OBD II system can clear Permanent DTCs. The OBD II system must determine that the malfunction that caused the Permanent DTC to be stored no longer exists and is not commanding the MIL.

- If the MIL goes out naturally due to 3 passing drive cycles (scan tool code clear is not used), then the Permanent DTC is cleared at power down of the last drive cycle.
- If a scan tool code clear is used to turn off the MIL then the Permanent DTC is not cleared, the DTC must PASS and not FAIL. The Permanent DTC is cleared at power down of the drive cycle.
- If the controller is programmed, all Permanent DTCs are cleared.

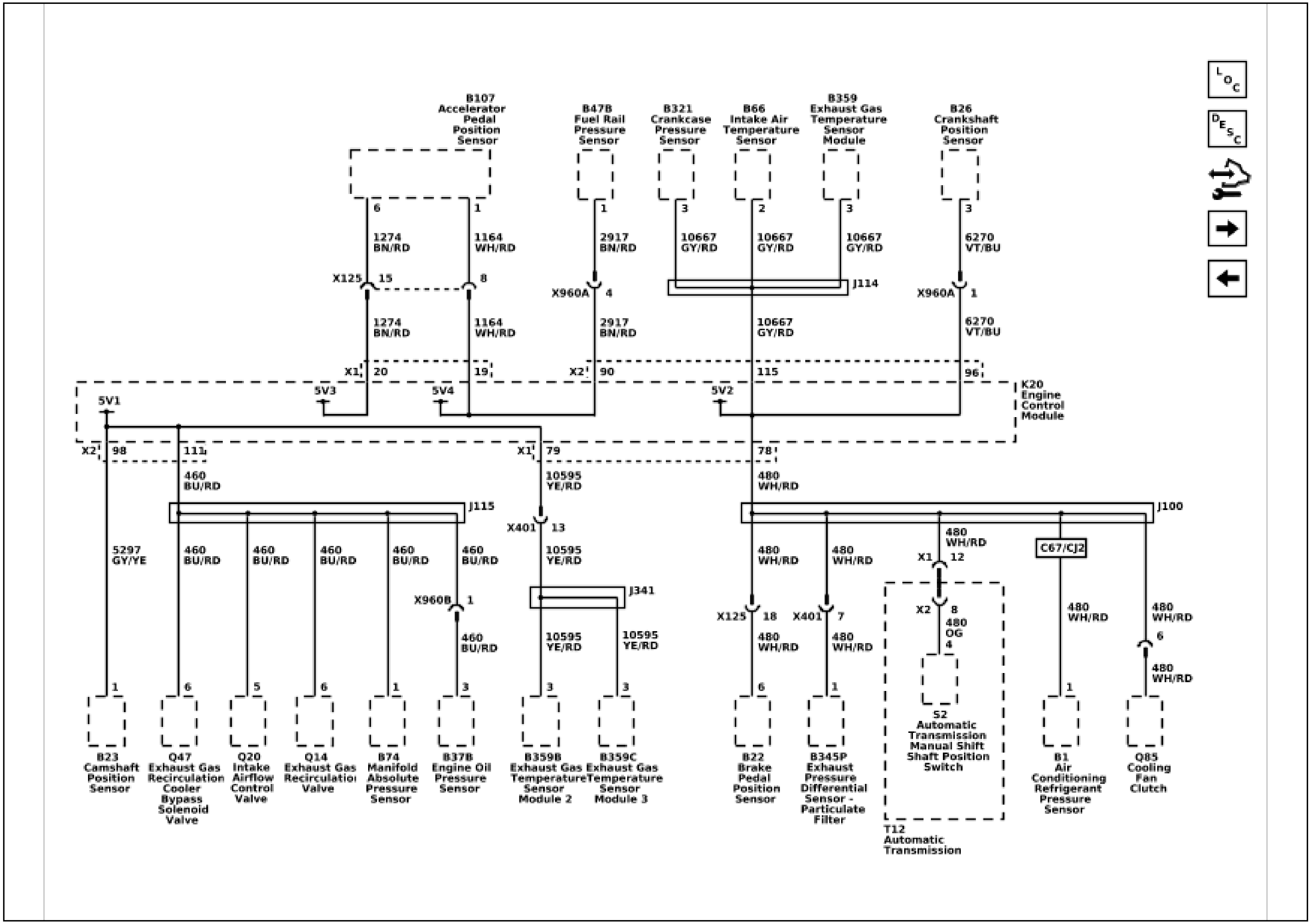
Engine Controls and Fuel - 6.6L Diesel

Schematic and Routing Diagrams

Engine Controls Schematics (Power, Ground, Serial Data and MIL)


6846267
LOC
DESC
K20 Engine Control Module
Data Communication Schematics
4978 WH
4979 BU/YE
4976 WH
4977 BU/BK
4054 BU/GY
4055 WH
25
38
24
37
23
36
X1
IGN
X50B Battery Distribution Engine Compartment Fuse Block
F68A 60A
F58A 60A
B+
X6 A
X5 A
104 BN/BU
104 BN/BU
10
1
X3
B+
B+
X50A Engine Wiring Harness Junction Block
F88UA 15A
F91UA 15A
F86UA 30A
F78UA 15A
F46UA 15A
KR75 Engine Controls Ignition Relay
KR73 Ignition Main Relay
5
3
1
2
H3
H6
H1
F4
F3
A1
X3
5294 VT/BU
J108
5294 VT/BU
5290 VT/BU
5290 VT/BU
5991 YE
440 RD/BN
439 VT/GN
92
93
2
8
3
4
X1
IGN
IGN
IGN
B+
IGN
X1 1
251 BK/WH
G103B

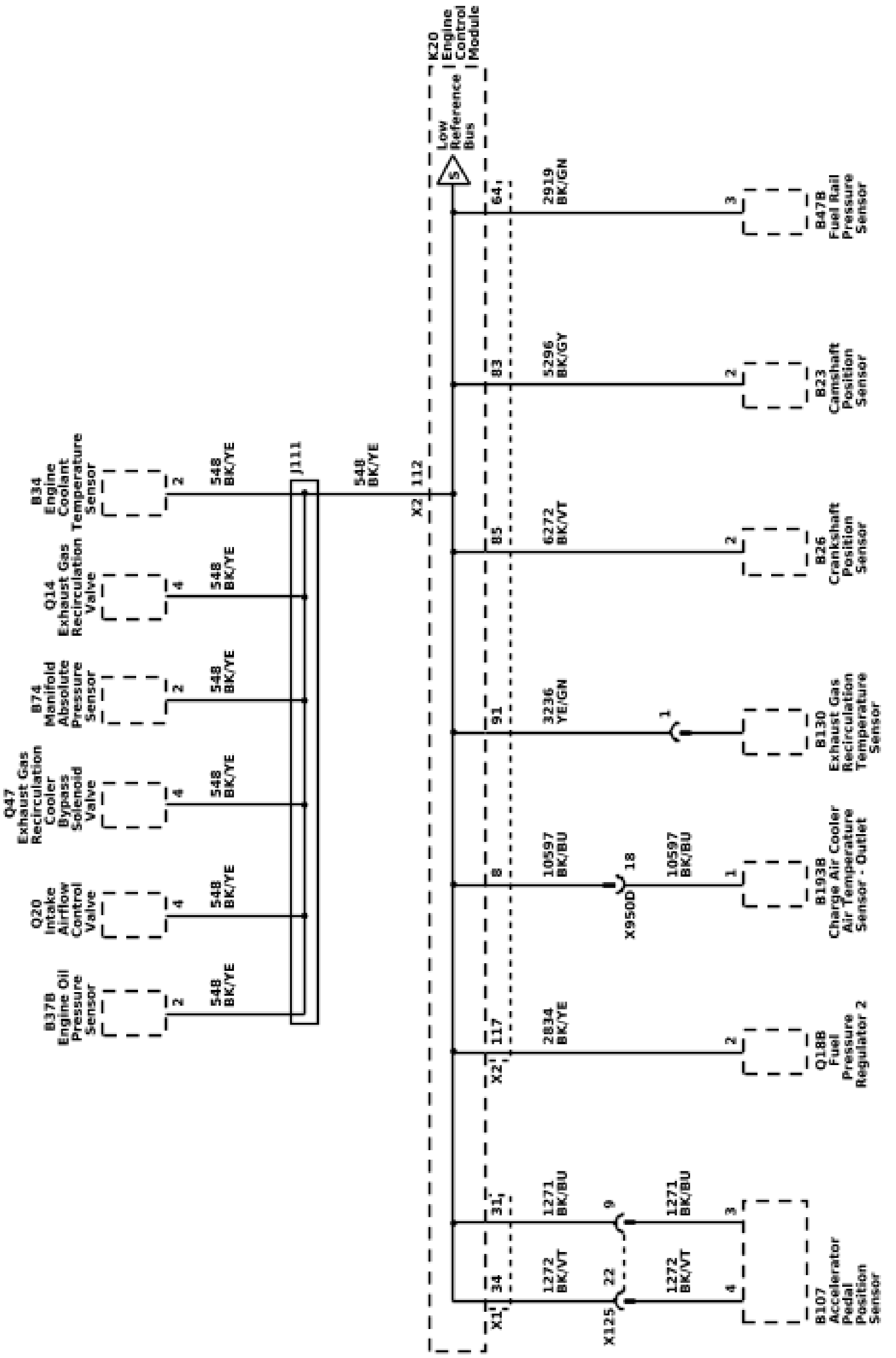
Engine Controls Schematics (5V Reference Bus)


B107 Accelerator Pedal Position Sensor
B47B Fuel Rail Pressure Sensor
B321 Crankcase Pressure Sensor
B66 Intake Air Temperature Sensor
B359 Exhaust Gas Temperature Sensor Module
B26 Crankshaft Position Sensor
6
1
1274 BN/RD
1164 WH/RD
1
2917 BN/RD
3
10667 GY/RD
2
10667 GY/RD
3
10667 GY/RD
3
6270 VT/BU
X125
15
8
X960A
4
J114
X960A
1
1274 BN/RD
1164 WH/RD
2917 BN/RD
10667 GY/RD
6270 VT/BU
X1
20
19
X2
90
115
96
K20 Engine Control Module
5V1
5V3
5V4
5V2
X2
98
111
X1
79
78
460 BU/RD
10595 YE/RD
480 WH/RD
J115
X401
13
J100
480 WH/RD
X1
12
C67/CJ2
5297 GY/YE
460 BU/RD
460 BU/RD
460 BU/RD
460 BU/RD
460 BU/RD
10595 YE/RD
480 WH/RD
480 WH/RD
J341
X960B
1
X2
8
480 OG
4
480 WH/RD
480 WH/RD
460 BU/RD
10595 YE/RD
10595 YE/RD
X125
18
X401
7
6
480 WH/RD
480 WH/RD
480 WH/RD
1
6
5
6
1
3
3
3
6
1
1
S2 Automatic Transmission Manual Shift Shaft Position Switch
B23 Camshaft Position Sensor
Q47 Exhaust Gas Recirculation Cooler Bypass Solenoid Valve
Q20 Intake Airflow Control Valve
Q14 Exhaust Gas Recirculation Valve
B74 Manifold Absolute Pressure Sensor
B37B Engine Oil Pressure Sensor
B359B Exhaust Gas Temperature Sensor Module 2
B359C Exhaust Gas Temperature Sensor Module 3
B22 Brake Pedal Position Sensor
B345P Exhaust Pressure Differential Sensor - Particulate Filter
T12 Automatic Transmission
B1 Air Conditioning Refrigerant Pressure Sensor
Q85 Cooling Fan Clutch
LOC
DESC

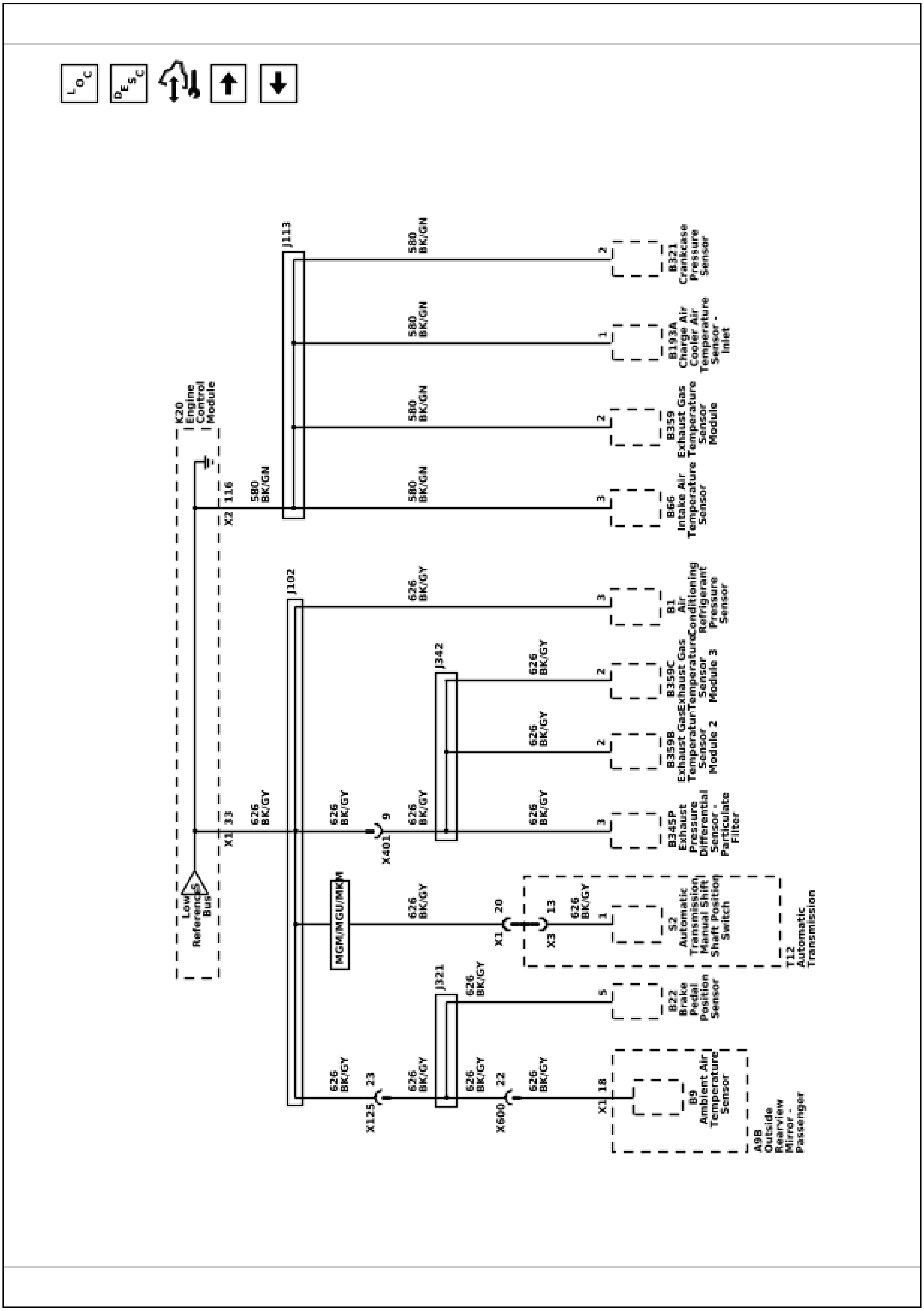
6846268

6846269

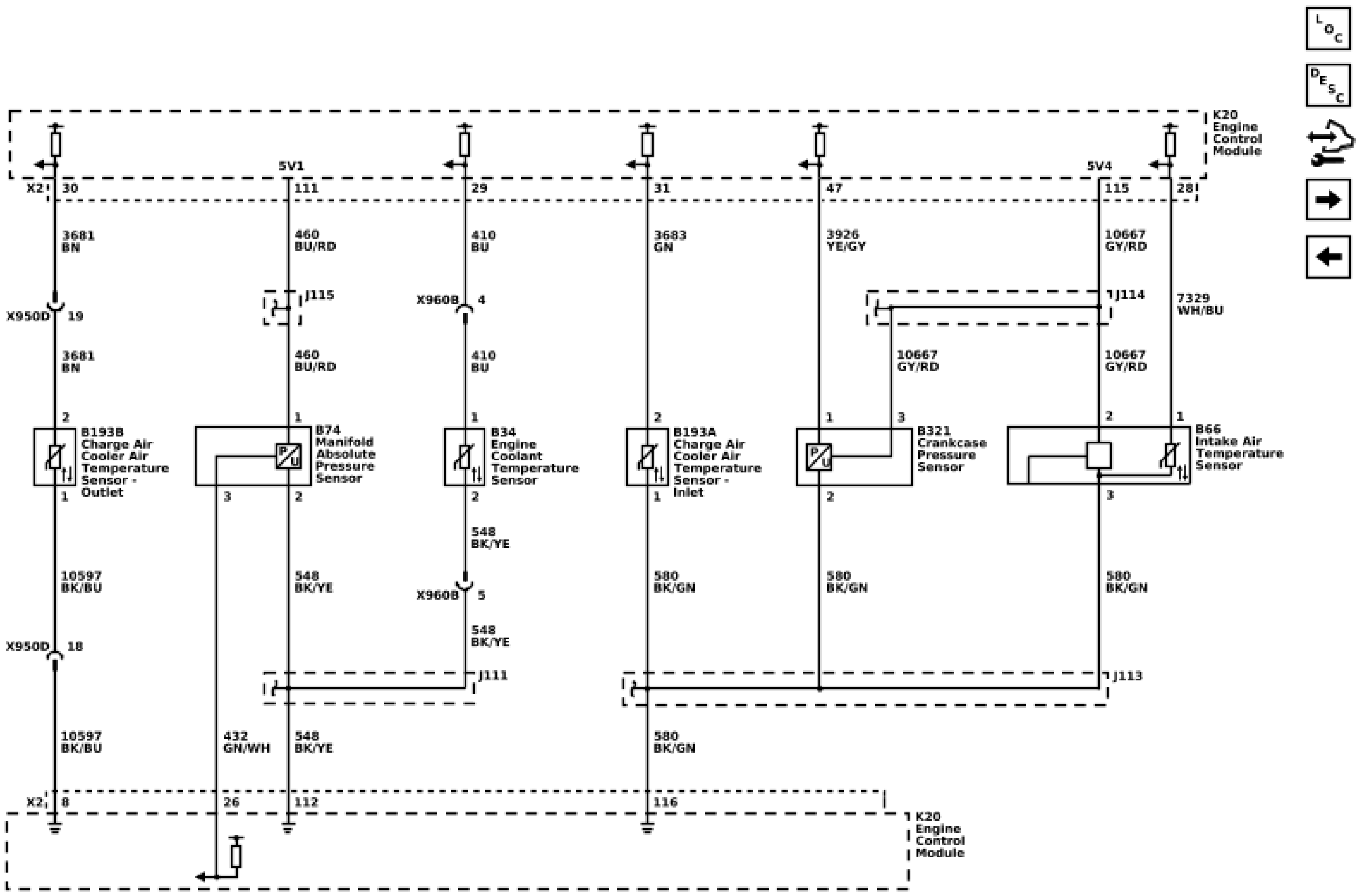
Engine Controls Schematics (Low Reference Bus - 1 of 2)


K20 Engine Control Module
Low Reference Bus
5
B34 Engine Coolant Temperature Sensor
Q14 Exhaust Gas Recirculation Valve
B74 Manifold Absolute Pressure Sensor
Q47 Exhaust Gas Recirculation Cooler Bypass Solenoid Valve
Q20 Intake Airflow Control Valve
B378 Engine Oil Pressure Sensor
2
4
548 BK/YE
J111
X2 112
64
2919 BK/GN
3
B478 Fuel Rail Pressure Sensor
83
5296 BK/GY
B23 Camshaft Position Sensor
85
6272 BK/VT
B26 Crankshaft Position Sensor
91
3236 YE/GN
1
B130 Exhaust Gas Recirculation Temperature Sensor
8
10597 BK/BU
18
X950D
B193B Charge Air Cooler Air Temperature Sensor - Outlet
X2 117
2834 BK/YE
Q18B Fuel Pressure Regulator 2
31
1271 BK/BU
9
X1 34
1272 BK/VT
22
X125
B107 Accelerator Pedal Position Sensor

Engine Controls Schematics (Low Reference Bus - 2 of 2)

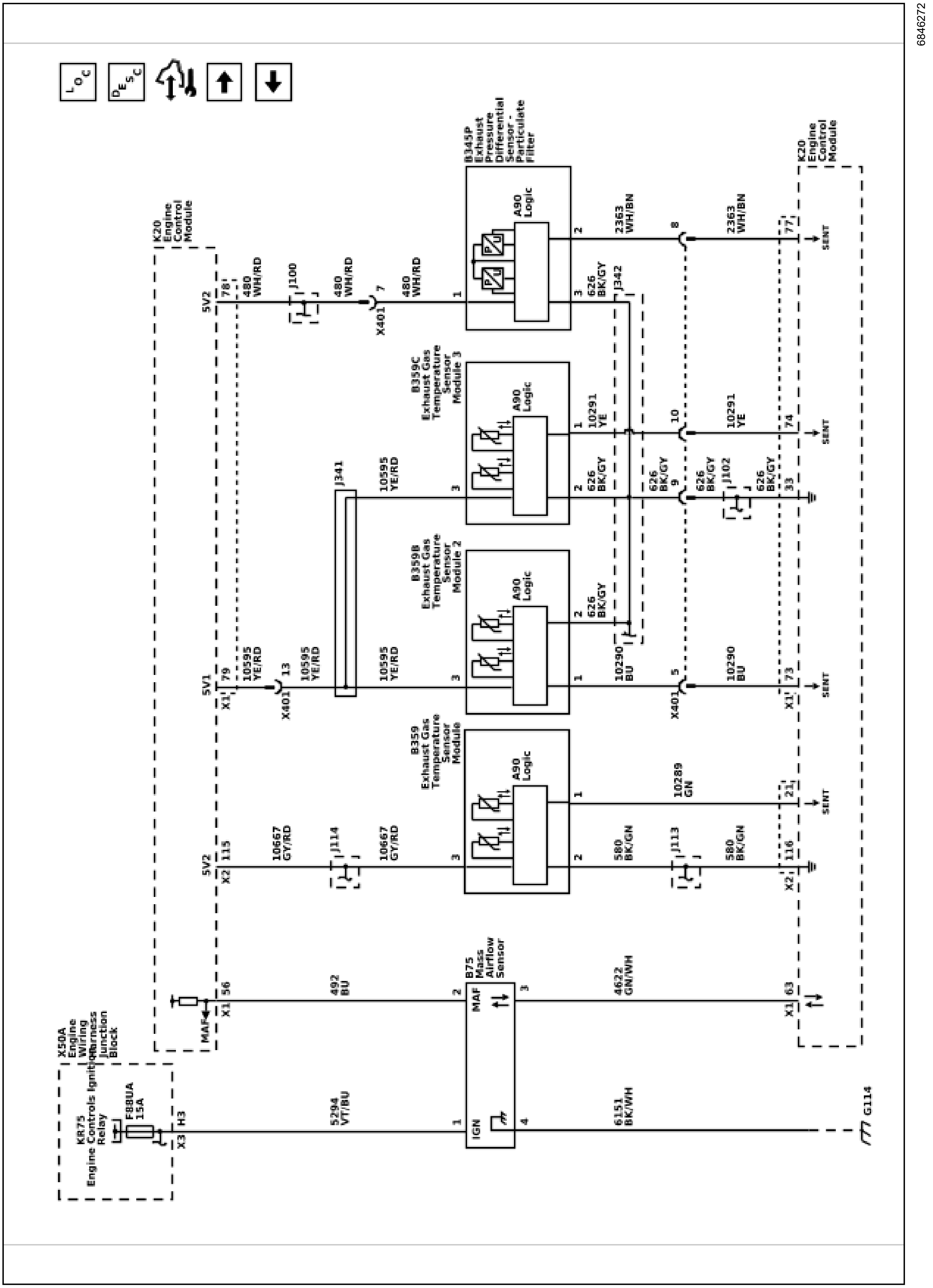

6846270
K20 Engine Control Module
Low Reference Bus
X2 116
580 BK/GN
X1 33
626 BK/GY
J113
J102
J342
J321
MGM/MGU/MKM
X401 9
X1 20
X3 13
X125 23
X600 22
X1 18
B321 Crankcase Pressure Sensor
B193A Charge Air Cooler Air Temperature Sensor - Inlet
B359 Exhaust Gas Temperature Sensor Module
B66 Intake Air Temperature Sensor
B1 Air Conditioning Refrigerant Pressure Sensor
B359C Exhaust Gas Temperature Sensor Module 3
B359B Exhaust Gas Temperature Sensor Module 2
B345P Exhaust Pressure Differential Sensor - Particulate Filter
S2 Automatic Transmission Manual Shift Shaft Position Switch
T12 Automatic Transmission
B22 Brake Pedal Position Sensor
B9 Ambient Air Temperature Sensor
A9B Outside Rearview Mirror - Passenger
1
2
3
5

Engine Controls Schematics (Engine Data Sensors - Pressure and Temperature 1 of 2)

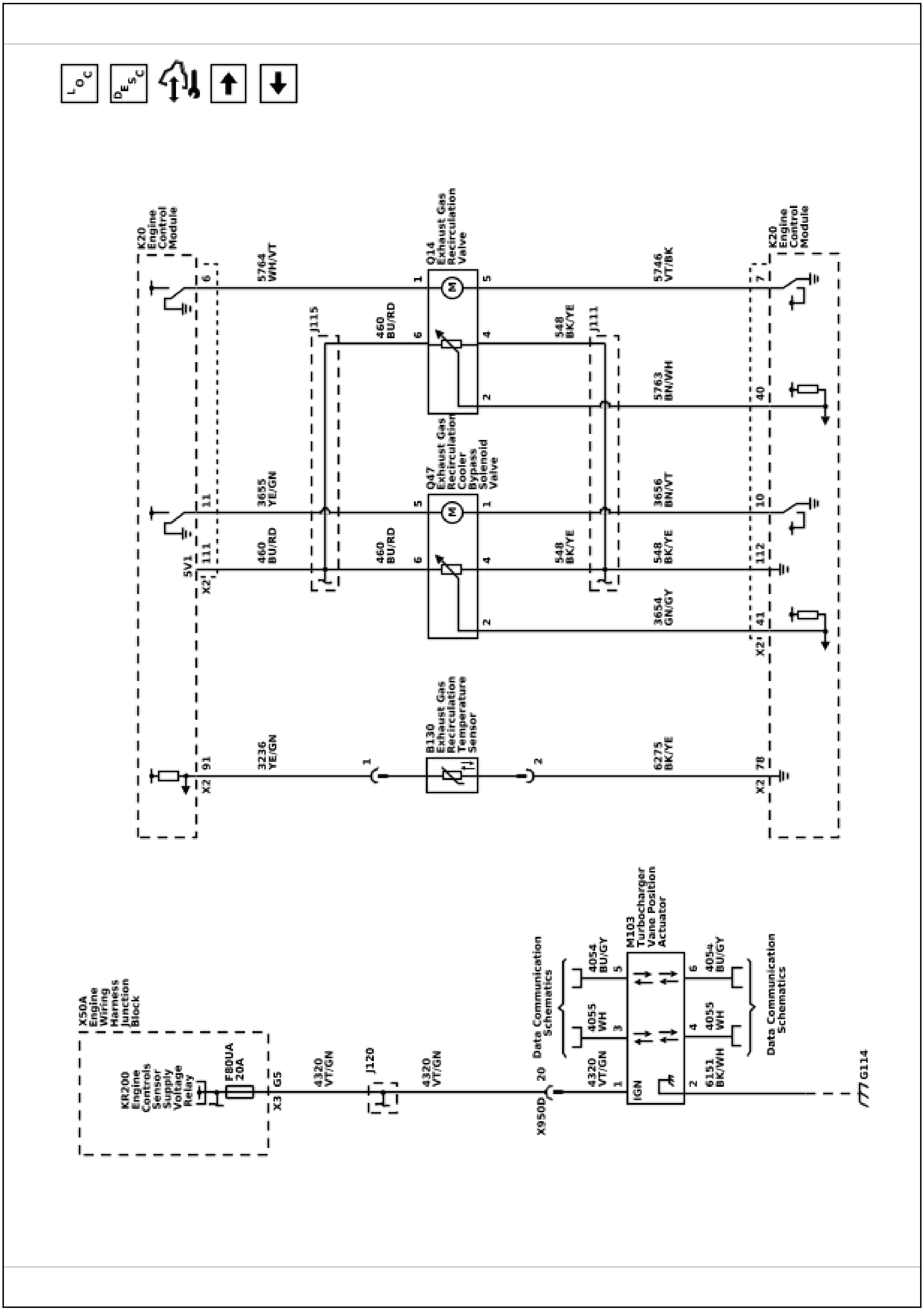

K20
Engine
Control
Module
X2
30
5V1
111
29
31
47
5V4
115
28
3681
BN
460
BU/RD
410
BU
3683
GN
3926
YE/GY
10667
GY/RD
7329
WH/BU
X950D
19
J115
X960B
4
J114
B193B
Charge Air
Cooler Air
Temperature
Sensor -
Outlet
B74
Manifold
Absolute
Pressure
Sensor
B34
Engine
Coolant
Temperature
Sensor
B193A
Charge Air
Cooler Air
Temperature
Sensor -
Inlet
B321
Crankcase
Pressure
Sensor
B66
Intake Air
Temperature
Sensor
1
2
3
548
BK/YE
10597
BK/BU
580
BK/GN
X960B
5
X950D
18
J111
J113
432
GN/WH
8
26
112
116

6846271

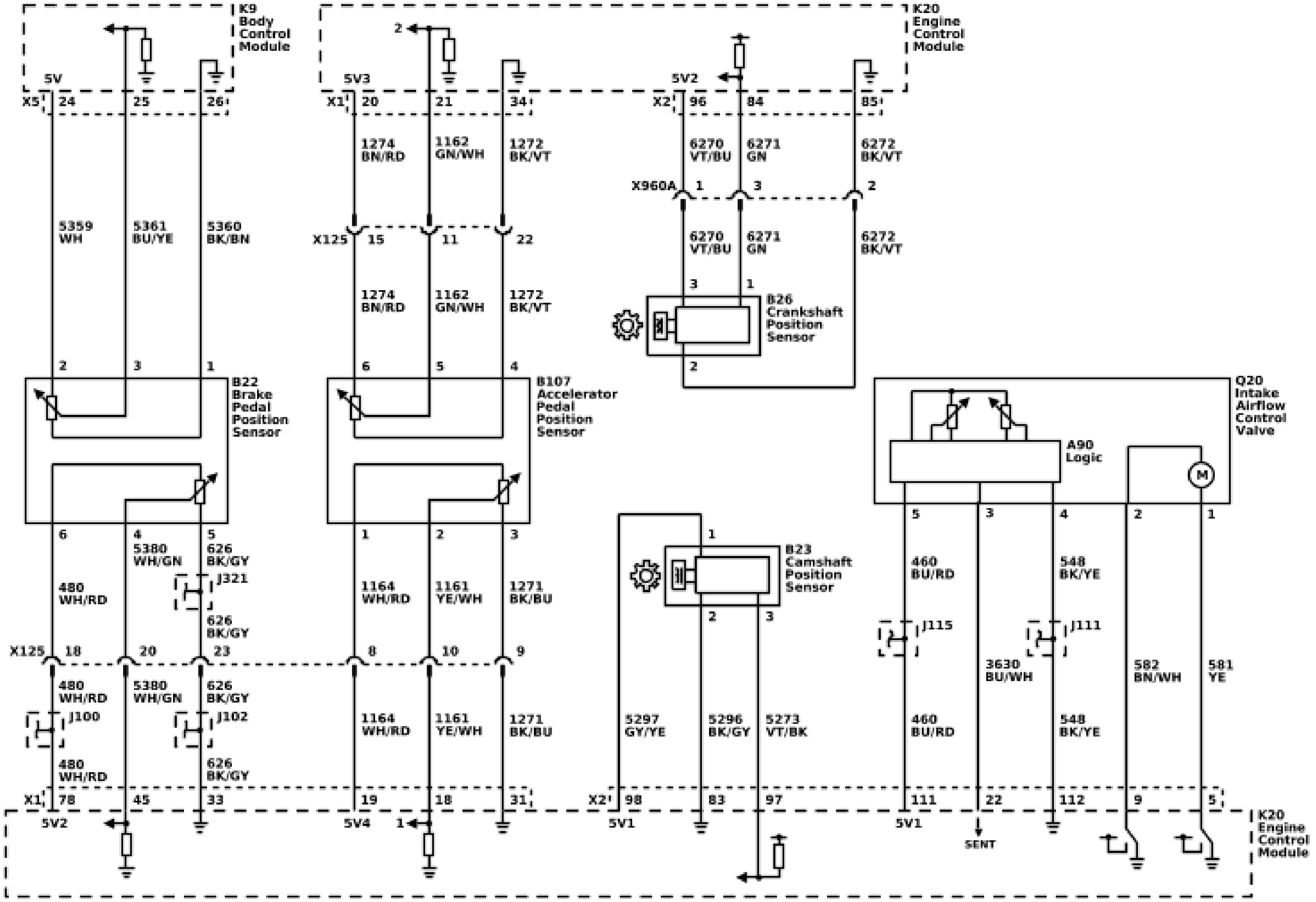
Engine Controls Schematics (Engine Data Sensors - Pressure and Temperature 2 of 2)


6846272
X50A Engine Wiring Harness Junction Block
KR75 Engine Controls Ignition Relay
F88UA 15A
X3 H3
5294 VT/BU
K20 Engine Control Module
MAF
X1 56
492 BU
B75 Mass Airflow Sensor
MAF
IGN
1
2
3
4
4622 GN/WH
X1 63
6151 BK/WH
G114
5V2
X2 115
10667 GY/RD
J114
10667 GY/RD
B359 Exhaust Gas Temperature Sensor Module
A90 Logic
3
2
1
580 BK/GN
J113
580 BK/GN
X2 116
10289 GN
21
SENT
5V1
X1 79
10595 YE/RD
X401 13
10595 YE/RD
J341
10595 YE/RD
B359B Exhaust Gas Temperature Sensor Module 2
A90 Logic
3
1
2
626 BK/GY
10290 BU
X401 5
10290 BU
X1 73
SENT
B359C Exhaust Gas Temperature Sensor Module 3
A90 Logic
3
2
1
626 BK/GY
10291 YE
626 BK/GY
9
626 BK/GY
J102
626 BK/GY
33
10
10291 YE
74
SENT
5V2
78
480 WH/RD
J100
480 WH/RD
X401 7
480 WH/RD
B345P Exhaust Pressure Differential Sensor - Particulate Filter
A90 Logic
P
P
1
3
2
626 BK/GY
J342
2363 WH/BN
8
2363 WH/BN
77
SENT
K20 Engine Control Module

Engine Controls Schematics (Engine Data Sensors - EGR and Turbocharger Controls)

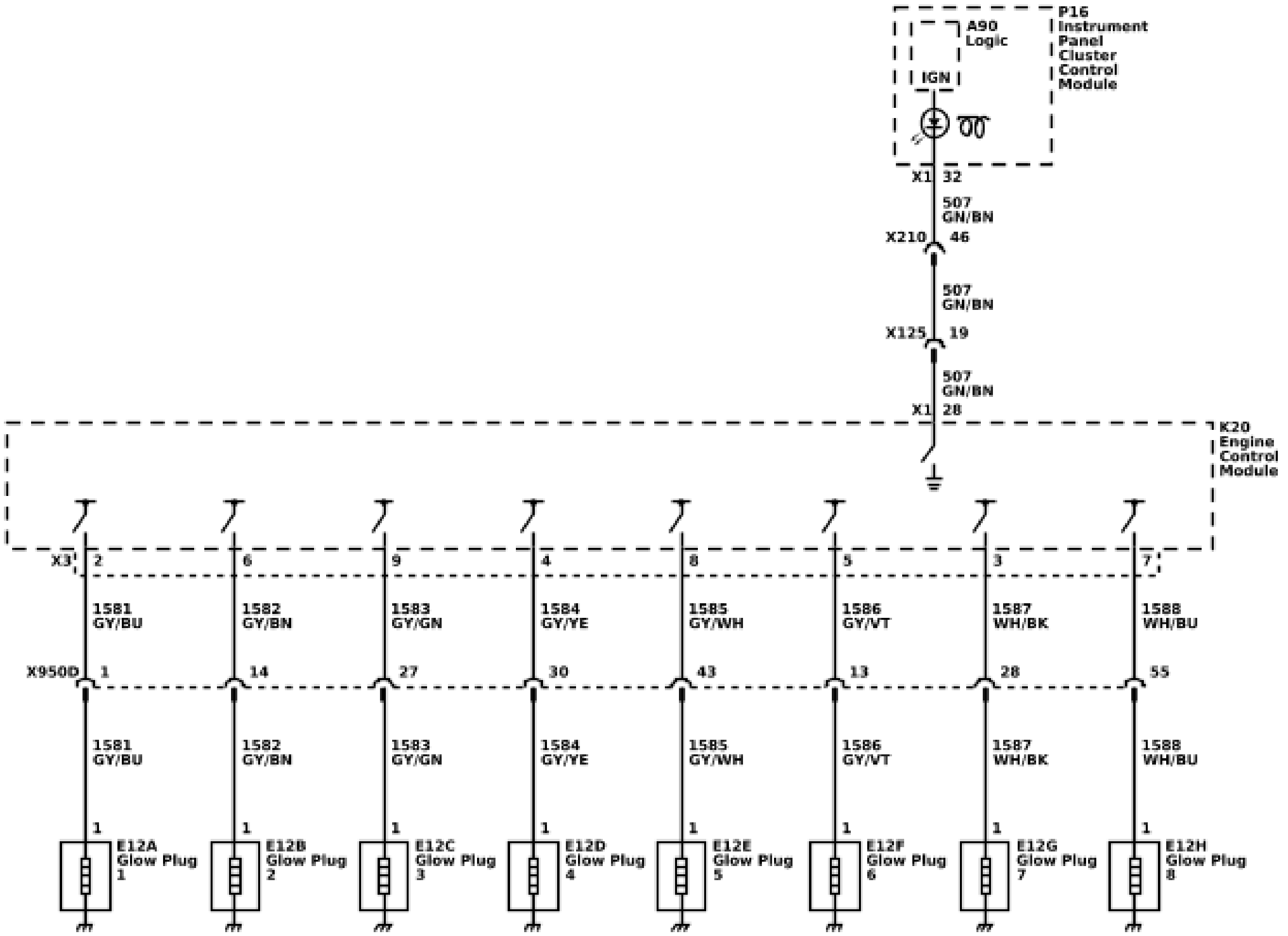

6846273
K20 Engine Control Module
Q14 Exhaust Gas Recirculation Valve
Q47 Exhaust Gas Recirculation Cooler Bypass Solenoid Valve
B130 Exhaust Gas Recirculation Temperature Sensor
X50A Engine Wiring Harness Junction Block
KR200 Engine Controls Sensor Supply Voltage Relay
F80UA 20A
M103 Turbocharger Vane Position Actuator
Data Communication Schematics
J115
J111
J120
X950D
G114
5V1
X2
X3
G5
5764 WH/VT
5746 VT/BK
460 BU/RD
548 BK/YE
5763 BN/WH
3655 YE/GN
3656 BN/VT
3654 GN/GY
3236 YE/GN
6275 BK/YE
4320 VT/GN
4055 WH
4054 BU/GY
6151 BK/WH
IGN
6
11
111
91
7
40
10
112
41
78
20
1
2
3
4
5
M

Engine Controls Schematics (Engine Data Sensors - Injector Timing Controls and Override)


K9 Body Control Module
5V
X5 24 25 26
5359 WH
5361 BU/YE
5360 BK/BN
2 3 1
B22 Brake Pedal Position Sensor
6 4 5
480 WH/RD
5380 WH/GN
626 BK/GY
J321
626 BK/GY
X125 18 20 23
480 WH/RD
5380 WH/GN
626 BK/GY
J100
J102
480 WH/RD
626 BK/GY
X1 78 45 33
5V2
K20 Engine Control Module
2
5V3
X1 20 21 34
1274 BN/RD
1162 GN/WH
1272 BK/VT
X125 15 11 22
1274 BN/RD
1162 GN/WH
1272 BK/VT
6 5 4
B107 Accelerator Pedal Position Sensor
1 2 3
1164 WH/RD
1161 YE/WH
1271 BK/BU
8 10 9
1164 WH/RD
1161 YE/WH
1271 BK/BU
19 18 31
5V4
1
5V2
X2 96 84 85
6270 VT/BU
6271 GN
6272 BK/VT
X960A 1 3 2
6270 VT/BU
6271 GN
6272 BK/VT
3 1
B26 Crankshaft Position Sensor
2
1
B23 Camshaft Position Sensor
2 3
5297 GY/YE
5296 BK/GY
5273 VT/BK
X2 98 83 97
5V1
Q20 Intake Airflow Control Valve
A90 Logic
M
5 3 4 2 1
460 BU/RD
548 BK/YE
J115
J111
3630 BU/WH
582 BN/WH
581 YE
460 BU/RD
548 BK/YE
111 22 112 9 5
5V1
SENT
K20 Engine Control Module

6846274

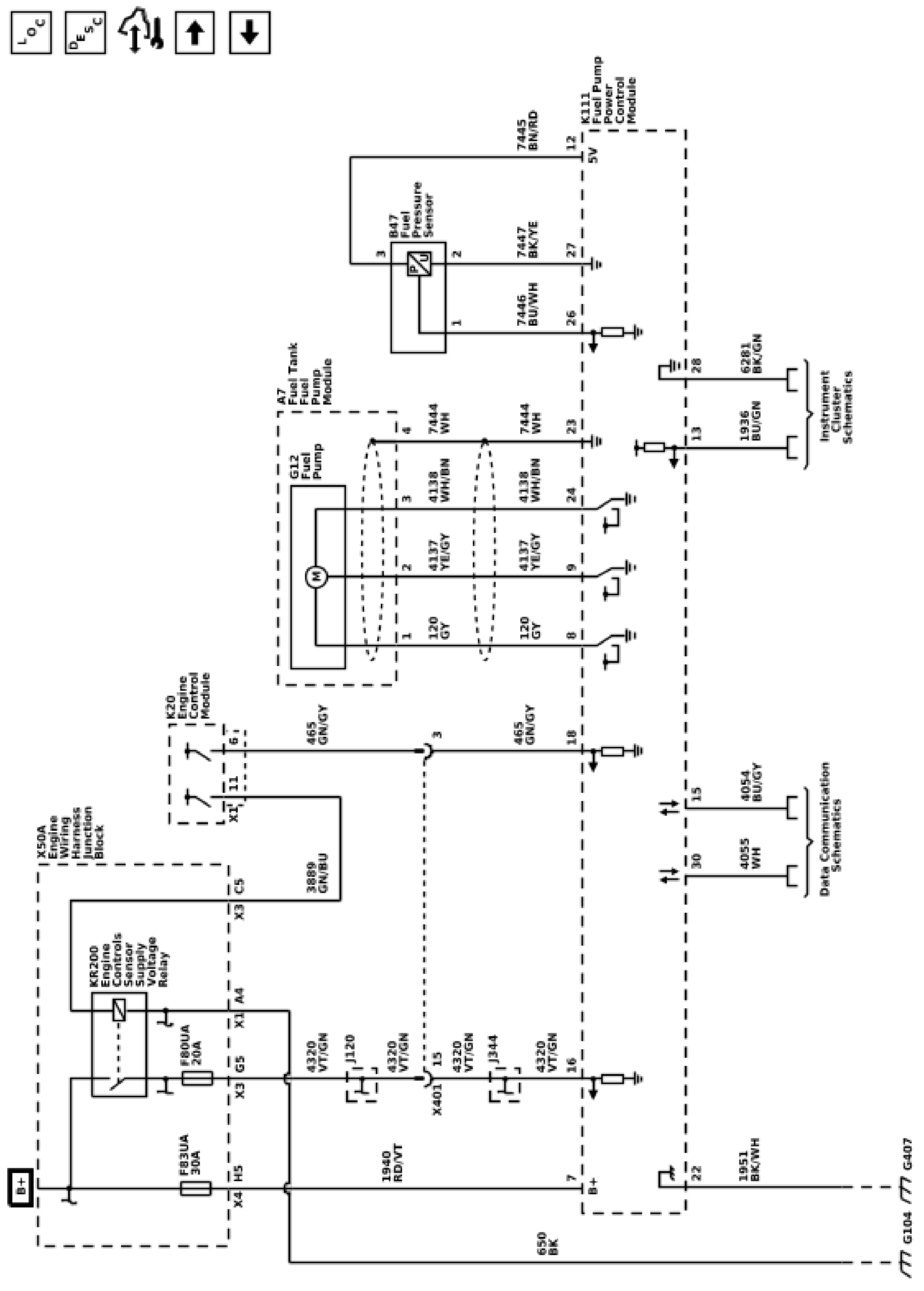
Engine Controls Schematics (Engine Data Sensors - Glow Plug Controls)


P16
Instrument
Panel
Cluster
Control
Module
A90
Logic
IGN
X1 32
507
GN/BN
X210 46
507
GN/BN
X125 19
507
GN/BN
X1 28
K20
Engine
Control
Module
X3 2
6
9
4
8
5
3
7
1581
GY/BU
1582
GY/BN
1583
GY/GN
1584
GY/YE
1585
GY/WH
1586
GY/VT
1587
WH/BK
1588
WH/BU
X950D 1
14
27
30
43
13
28
55
1581
GY/BU
1582
GY/BN
1583
GY/GN
1584
GY/YE
1585
GY/WH
1586
GY/VT
1587
WH/BK
1588
WH/BU
1
E12A
Glow Plug
1
E12B
Glow Plug
2
E12C
Glow Plug
3
E12D
Glow Plug
4
E12E
Glow Plug
5
E12F
Glow Plug
6
E12G
Glow Plug
7
E12H
Glow Plug
8

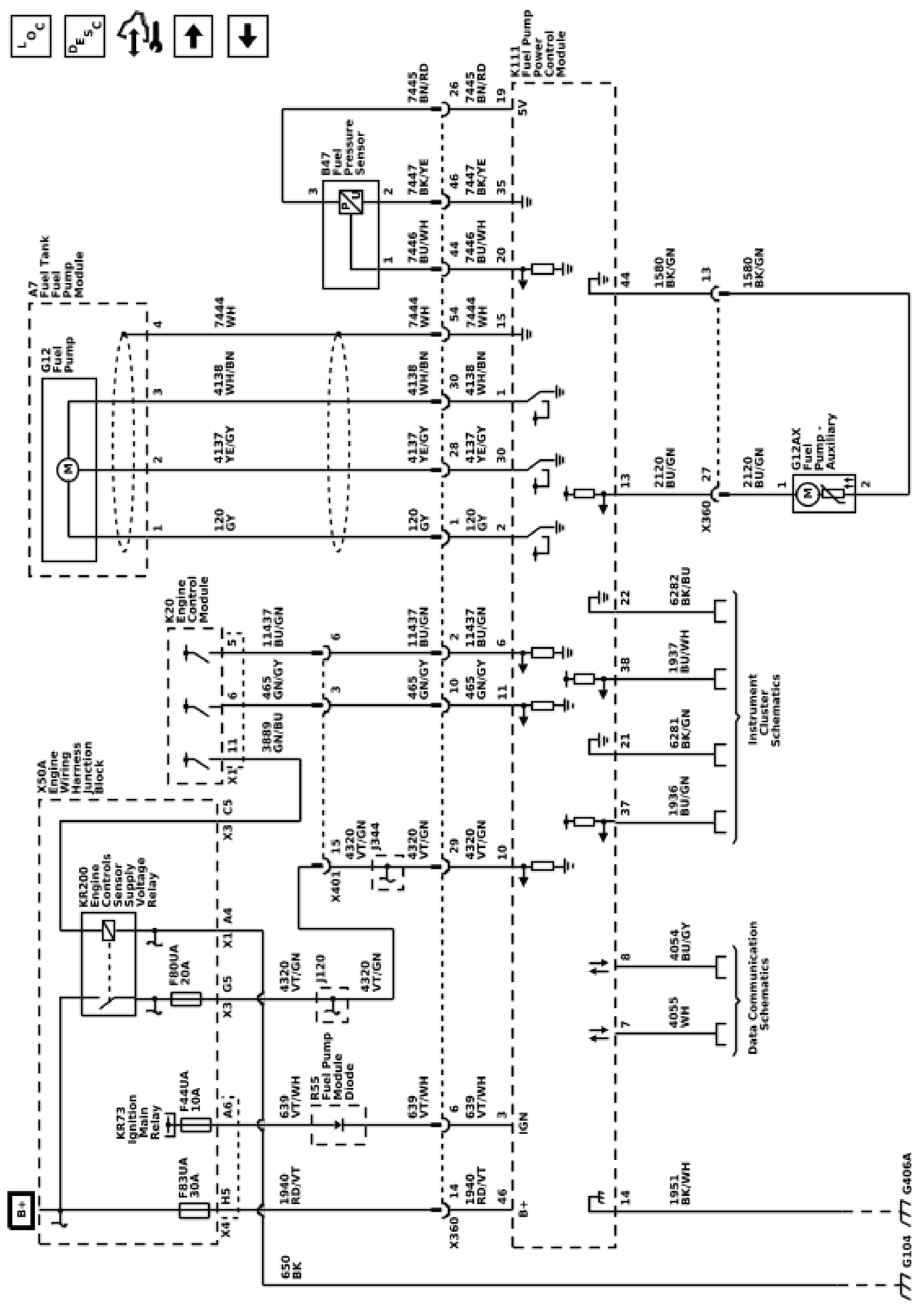
6846275

Engine Controls Schematics (Fuel Controls - Fuel Pump Controls (-N2N))

6846276


B+
X50A Engine Wiring Harness Junction Block
F83UA 30A
F80UA 20A
KR200 Engine Controls Sensor Supply Voltage Relay
X4 H5
X3 G5
X1 A4
X3 C5
3889 GN/BU
K20 Engine Control Module
X1 11
6
465 GN/GY
3
1940 RD/VT
4320 VT/GN
J120
X401
15
J344
16
650 BK
G104
G407
A7 Fuel Tank Fuel Pump Module
G12 Fuel Pump
M
1
2
3
4
120 GY
4137 YE/GY
4138 WH/BN
7444 WH
8
9
24
23
B47 Fuel Pressure Sensor
P/U
7446 BU/WH
7447 BK/YE
7445 BN/RD
26
27
12
5V
18
K111 Fuel Pump Power Control Module
7
B+
22
1951 BK/WH
30
4055 WH
15
4054 BU/GY
Data Communication Schematics
13
1936 BU/GN
28
6281 BK/GN
Instrument Cluster Schematics

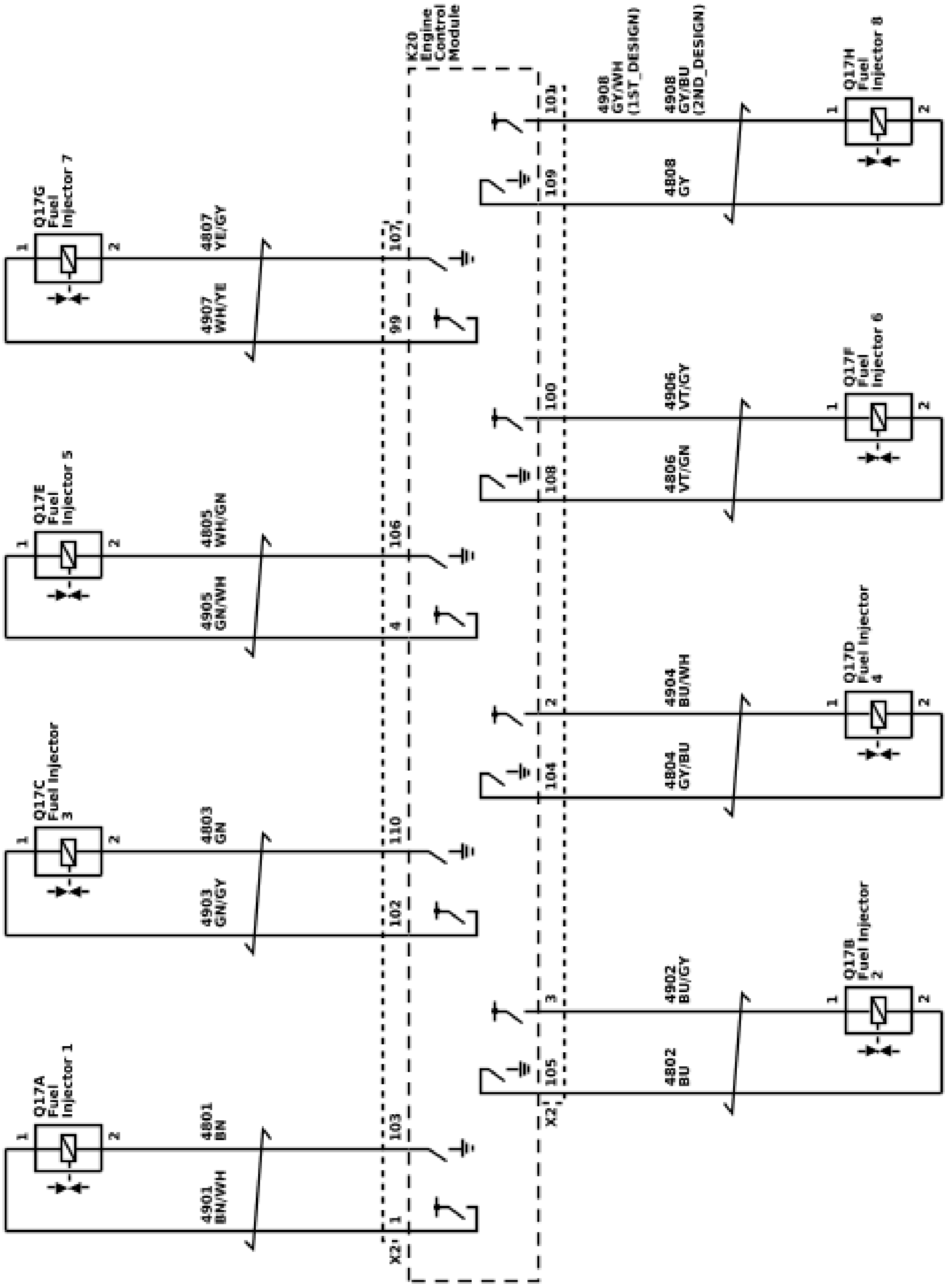
Engine Controls Schematics (Fuel Controls - Fuel Pump Controls (N2N))



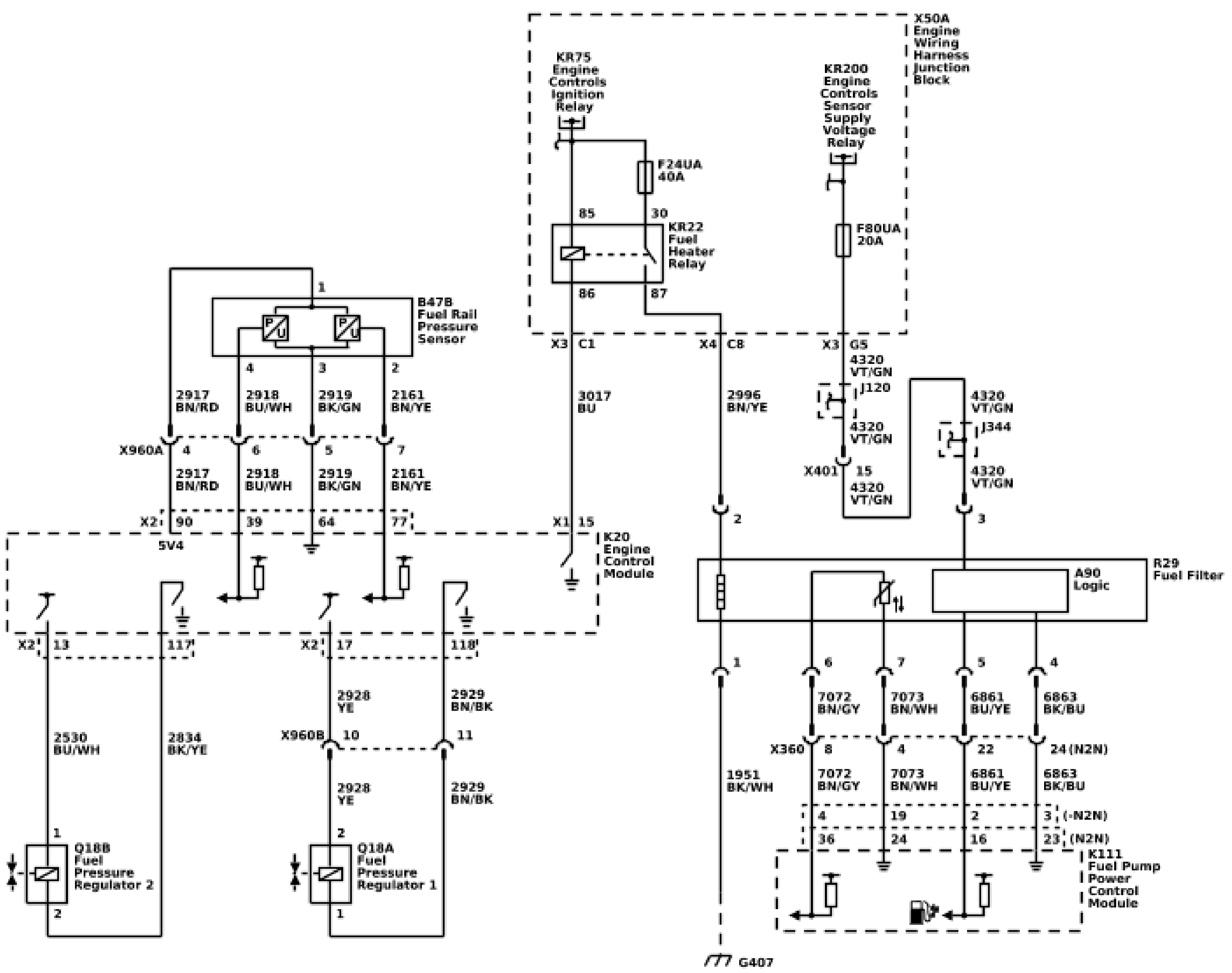
LOC
DESC
B+
X50A Engine Wiring Harness Junction Block
KR200 Engine Controls Sensor Supply Voltage Relay
KR73 Ignition Main Relay
F83UA 30A
F44UA 10A
F80UA 20A
X4 H5
A6
X3 G5
X1 A4
X3 C5
X1 11
K20 Engine Control Module
5 6 11
3889 GN/BU
465 GN/GY
11437 BU/GN
1940 RD/VT
639 VT/WH
4320 VT/GN
650 BK
R55 Fuel Pump Module Diode
J120
J344
X401 15
3 6
A7 Fuel Tank Fuel Pump Module
G12 Fuel Pump
M
1 2 3 4
120 GY
4137 YE/GY
4138 WH/BN
7444 WH
B47 Fuel Pressure Sensor
1 2 3
7446 BU/WH
7447 BK/YE
7445 BN/RD
X360
14 6 29 10 2 1 28 30 54 44 46 26
46 3 10 11 6 2 30 1 15 20 35 19
B+
IGN
5V
K111 Fuel Pump Power Control Module
14 7 8 37 21 38 22 13 44
1951 BK/WH
4055 WH
4054 BU/GY
1936 BU/GN
6281 BK/GN
1937 BU/WH
6282 BK/BU
2120 BU/GN
1580 BK/GN
Data Communication Schematics
Instrument Cluster Schematics
X360 27 13
G12AX Fuel Pump - Auxiliary
1 2
G104
G406A

6846277

Engine Controls Schematics (Fuel Controls - Fuel Injectors)

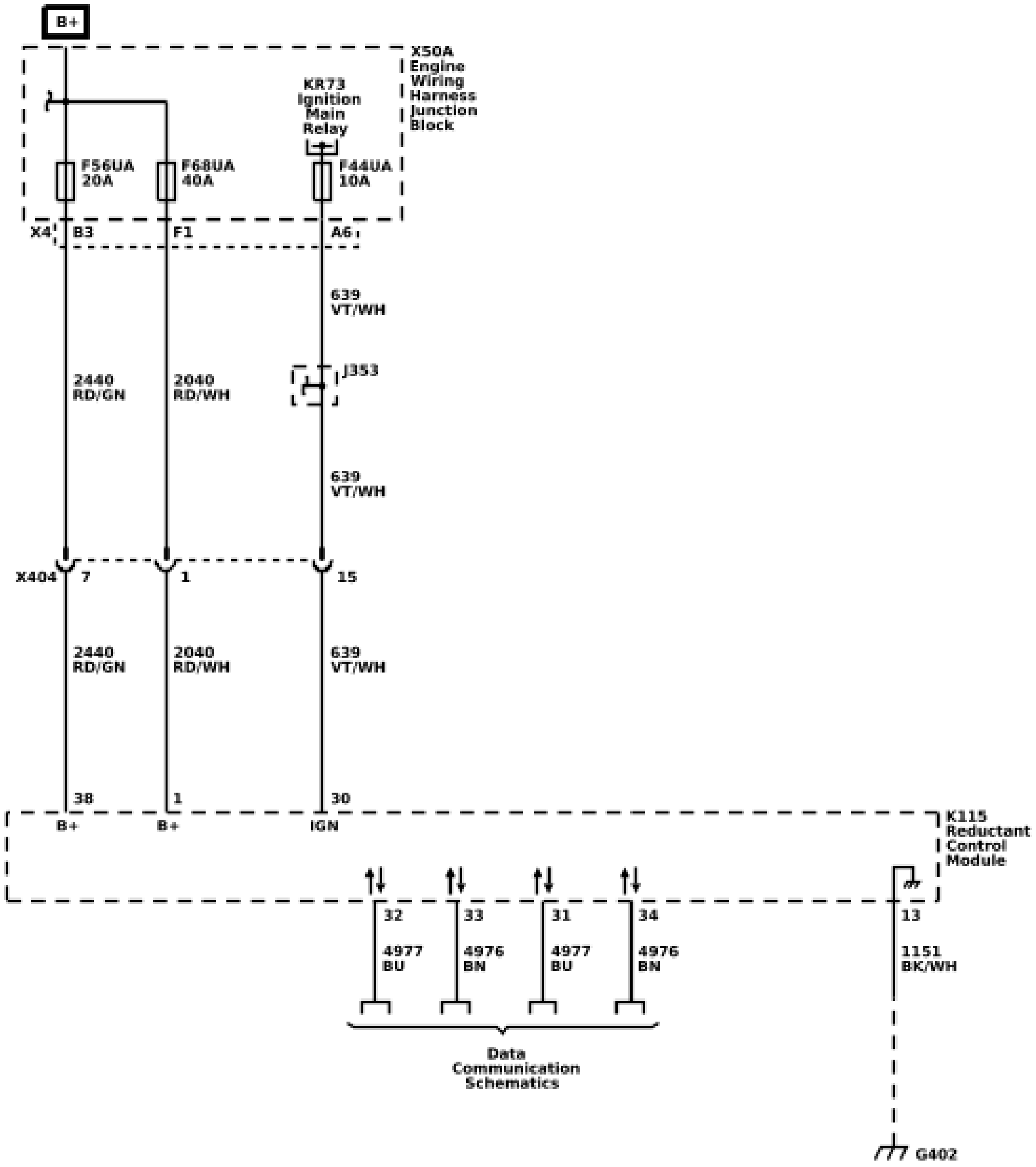

6846278
K20 Engine Control Module
Q17A Fuel Injector 1
Q17B Fuel Injector 2
Q17C Fuel Injector 3
Q17D Fuel Injector 4
Q17E Fuel Injector 5
Q17F Fuel Injector 6
Q17G Fuel Injector 7
Q17H Fuel Injector 8
1
2
4801 BN
4901 BN/WH
4802 BU
4902 BU/GY
4803 GN
4903 GN/GY
4804 GY/BU
4904 BU/WH
4805 WH/GN
4905 GN/WH
4806 VT/GN
4906 VT/GY
4807 YE/GY
4907 WH/YE
4808 GY
4908 GY/WH (1ST_DESIGN)
4908 GY/BU (2ND_DESIGN)
X2
X2
1
103
102
110
4
106
99
107
105
3
104
2
108
100
109
101

Engine Controls Schematics (Fuel Controls - Water in Fuel, Temperature and Pressure Controls)


X50A Engine Wiring Harness Junction Block
KR75 Engine Controls Ignition Relay
F24UA 40A
85
30
KR22 Fuel Heater Relay
86
87
KR200 Engine Controls Sensor Supply Voltage Relay
F80UA 20A
X3 C1
X4 C8
X3 G5
4320 VT/GN
J120
4320 VT/GN
X401 15
4320 VT/GN
4320 VT/GN
J344
4320 VT/GN
3
3017 BU
2996 BN/YE
2
B47B Fuel Rail Pressure Sensor
1
4
3
2
2917 BN/RD
2918 BU/WH
2919 BK/GN
2161 BN/YE
X960A 4
6
5
7
2917 BN/RD
2918 BU/WH
2919 BK/GN
2161 BN/YE
X2 90
39
64
77
5V4
X1 15
K20 Engine Control Module
R29 Fuel Filter
A90 Logic
X2 13
117
X2 17
118
2530 BU/WH
2834 BK/YE
2928 YE
2929 BN/BK
X960B 10
11
2928 YE
2929 BN/BK
1
Q18B Fuel Pressure Regulator 2
2
2
Q18A Fuel Pressure Regulator 1
1
1
1951 BK/WH
G407
6
7
5
4
7072 BN/GY
7073 BN/WH
6861 BU/YE
6863 BK/BU
X360 8
4
22
24 (N2N)
7072 BN/GY
7073 BN/WH
6861 BU/YE
6863 BK/BU
4
19
2
3 (-N2N)
36
24
16
23 (N2N)
K111 Fuel Pump Power Control Module

6846279

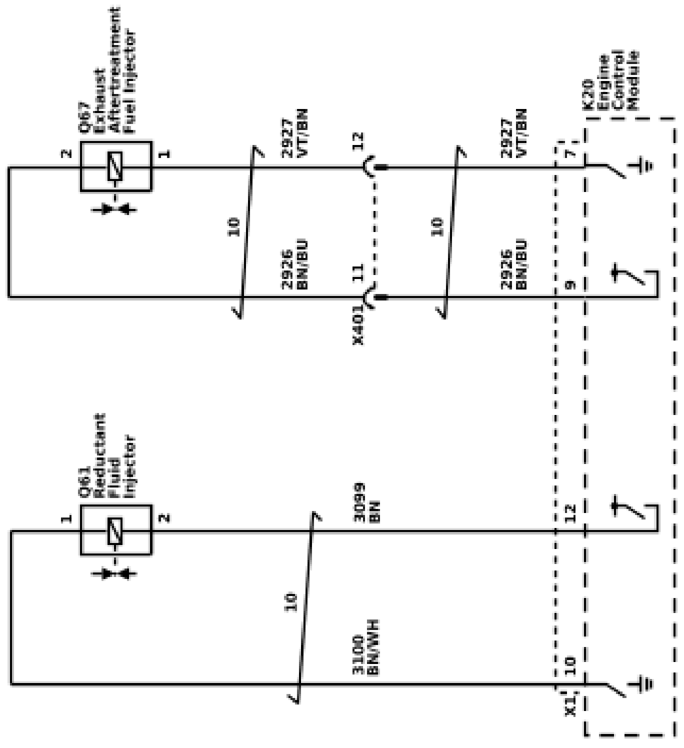
Engine Controls Schematics (Reductant Controls - Module Power, Ground and Serial Data)


B+
X50A
Engine
Wiring
Harness
Junction
Block
KR73
Ignition
Main
Relay
F56UA
20A
F68UA
40A
F44UA
10A
X4
B3
F1
A6
639
VT/WH
J353
2440
RD/GN
2040
RD/WH
639
VT/WH
X404
7
1
15
2440
RD/GN
2040
RD/WH
639
VT/WH
38
1
30
B+
B+
IGN
K115
Reductant
Control
Module
32
33
31
34
13
4977
BU
4976
BN
4977
BU
4976
BN
1151
BK/WH
Data
Communication
Schematics
G402

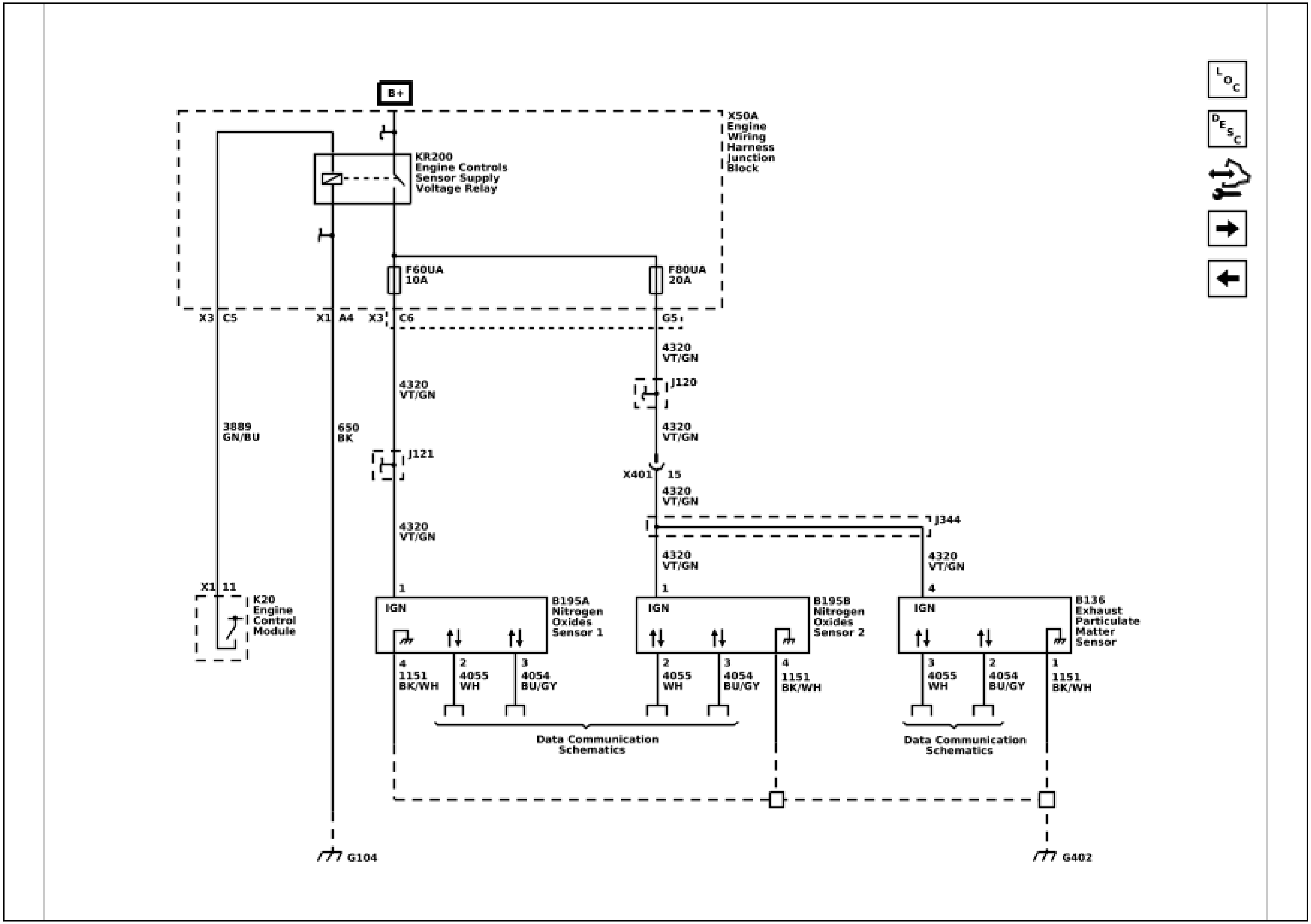
6846280

Engine Controls Schematics (Reductant Controls - Reductant Fluid Injector and Exhaust Aftertreatment Fuel Injector)

6846281

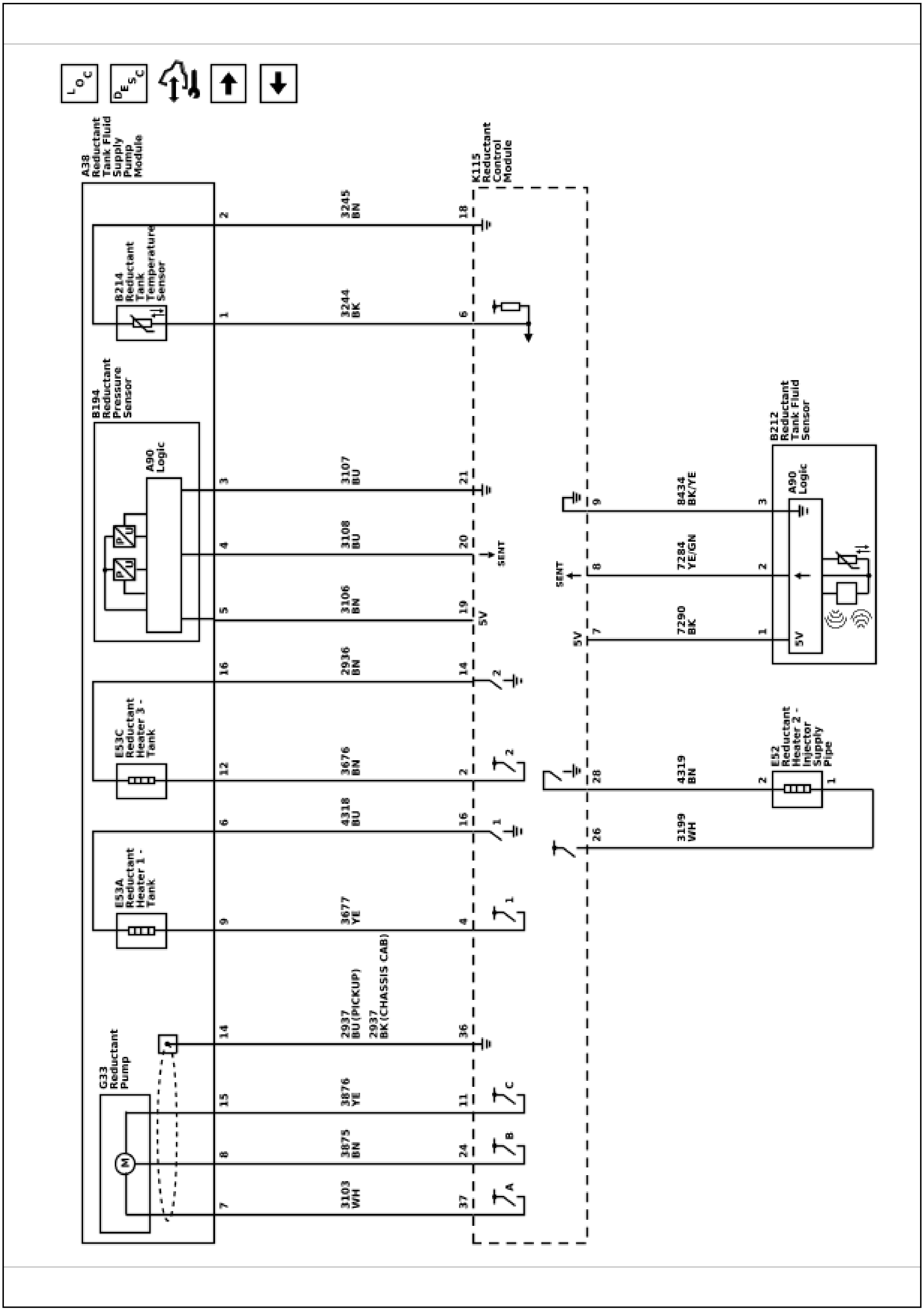

Q67
Exhaust
Aftertreatment
Fuel Injector
2
1
10
2927
VT/BN
12
2926
BN/BU
11
X401
10
2927
VT/BN
7
2926
BN/BU
9
K20
Engine
Control
Module
Q61
Reductant
Fluid
Injector
1
2
10
3099
BN
3100
BN/WH
12
10
X1

Engine Controls Schematics (Reductant Controls - Exhaust Sensors)


B+
X50A Engine Wiring Harness Junction Block
KR200 Engine Controls Sensor Supply Voltage Relay
F60UA 10A
F80UA 20A
X3 C5
X1 A4
X3 C6
G5
3889 GN/BU
650 BK
4320 VT/GN
J121
J120
X401 15
J344
X1 11
K20 Engine Control Module
IGN
B195A Nitrogen Oxides Sensor 1
B195B Nitrogen Oxides Sensor 2
B136 Exhaust Particulate Matter Sensor
1151 BK/WH
4055 WH
4054 BU/GY
Data Communication Schematics
G104
G402

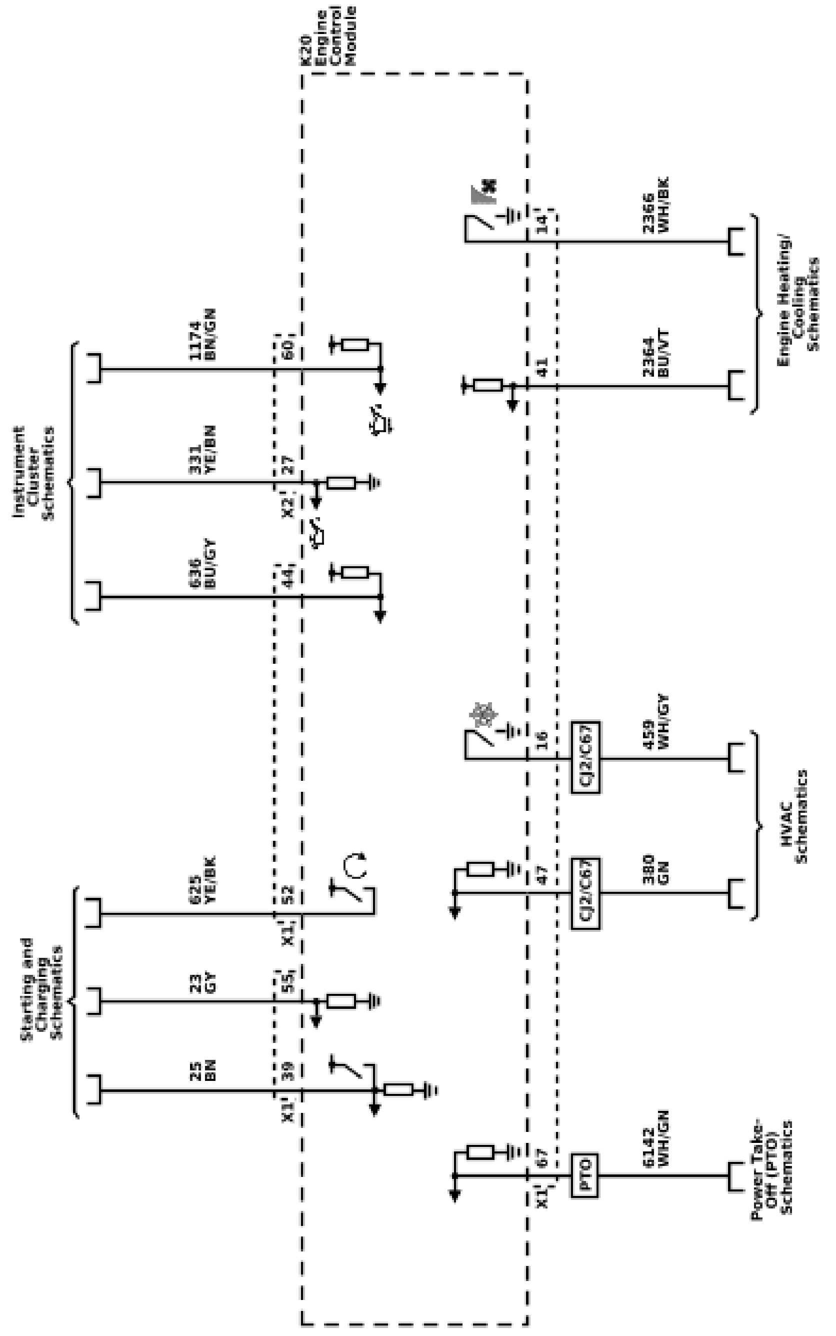
6846282

Engine Controls Schematics (Reductant Controls - Reductant Pump and Sensor Assembly, Line Heater and Reductant Sensor Module)


A38 Reductant Tank Fluid Supply Pump Module
B214 Reductant Tank Temperature Sensor
B194 Reductant Pressure Sensor
A90 Logic
E53C Reductant Heater 3 - Tank
E53A Reductant Heater 1 - Tank
G33 Reductant Pump
M
K115 Reductant Control Module
B212 Reductant Tank Fluid Sensor
E52 Reductant Heater 2 - Injector Supply Pipe
2
3245 BN
18
1
3244 BK
6
3
3107 BU
21
4
3108 BU
20
SENT
5
3106 BN
19
5V
16
2936 BN
14
12
3676 BN
2
6
4318 BU
16
9
3677 YE
4
14
2937 BU (PICKUP)
2937 BK (CHASSIS CAB)
36
15
3876 YE
11
C
8
3875 BN
24
B
7
3103 WH
37
A
9
8434 BK/YE
3
8
7284 YE/GN
2
7
7290 BK
1
28
4319 BN
26
3199 WH
P
U

6846283

Engine Controls Schematics (Controlled/Monitored Subsystem Reference)


K20 Engine Control Module
Instrument Cluster Schematics
1174 BN/GN
60
331 YE/BN
27
X2
636 BU/GY
44
Starting and Charging Schematics
625 YE/BK
52
X1
23 GY
55
25 BN
39
X1
2366 WH/BK
14
2364 BU/VT
41
Engine Heating/ Cooling Schematics
459 WH/GY
16
CJ2/C67
380 GN
47
CJ2/C67
HVAC Schematics
6142 WH/GN
67
X1
PTO
Power Take-Off (PTO) Schematics
6846284

Description and Operation

Inspection/Maintenance Description and Operation

Some state/provincial and local governments require that a vehicle pass on-board diagnostic (OBD) system tests and the Inspection/Maintenance (I/M) emission inspection in order to renew license plates. This is accomplished by viewing the I/M System monitors on a scan tool and confirming that no Permanent DTCs are set.

The OBD II system monitors all emission control systems that are on-board. The OBD II regulations require monitoring of the following:

Monitor	Diesel	Gasoline
Boost System Monitor - Since Diagnostic Trouble Codes Cleared	X	—
Catalytic Converter Monitor - Since Diagnostic Trouble Codes Cleared	X	X
Evaporative Emission Monitor - Since Diagnostic Trouble Codes Cleared	—	X
Exhaust Aftertreatment Monitor - Since Diagnostic Trouble Codes Cleared	X	—
Exhaust Gas Recirculation Valve/Camshaft Position Monitor - Since Diagnostic Trouble Codes Cleared	X	X
Exhaust Gas Sensor Monitor - Since Diagnostic Trouble Codes Cleared	X	—
Fuel System Monitor - Since Diagnostic Trouble Codes Cleared	X	X
Heated Catalytic Converter Monitor - Since Diagnostic Trouble Codes Cleared	—	X
Misfire Monitor - Since Diagnostic Trouble Codes Cleared	X	X
Oxygen Sensor Heater Monitor - Since Diagnostic Trouble Codes Cleared	—	X
Oxygen Sensor/Heated Oxygen Sensor Monitor - Since Diagnostic Trouble Codes Cleared	—	X
Particulate Filter Monitor - Since Diagnostic Trouble Codes Cleared	X	X

I/M System Status

Each system monitor requires at least one, and sometimes several diagnostic tests. The result of each test is reported by a DTC. A system monitor is Complete when either all of the DTCs comprising the monitor have run and passed, or when any one of the DTCs comprising the monitor has illuminated the malfunction indicator lamp (MIL). For example, when the Oxygen Sensor Heater Monitor indicates Complete, all of the oxygen sensor heaters have been diagnosed. If the vehicle has 4 heated oxygen sensors, all 4 heaters have been diagnosed.

Once the system monitor is complete, the I/M System Status parameter will display Complete in the value column of the scan tool. Any monitor that is not applicable to a vehicle will display Not Supported in the scan tool value column. The I/M System Status parameter will display Incomplete in the value column when any of the required tests for that system have not run. The following is a list of conditions that would set the I/M System Status monitor to Incomplete:

- The vehicle is new from the factory and has not yet been driven through the necessary drive conditions to complete the tests.
- The battery has been disconnected or discharged below operating voltage.
- The control module power or ground has been interrupted.
- The control module has been programmed.
- The control module DTCs have been cleared.

Permanent DTCs

Permanent DTCs are defined as confirmed fault codes that are currently commanding the MIL on and stored in non-volatile memory. Permanent DTCs cannot be erased by any scan tool command or by disconnecting power to the controller.

The intended use of this data is to prevent vehicles from passing an I/M inspection by disconnecting the battery or clearing codes with a scan tool prior to the inspection. The presence of Permanent DTCs at an inspection without the MIL illuminated is an indication that a proper repair was not verified by the OBD II system.

Only the OBD II system can clear Permanent DTCs. The OBD II system must determine that the malfunction that caused the Permanent DTC to be stored no longer exists and is not commanding the MIL.

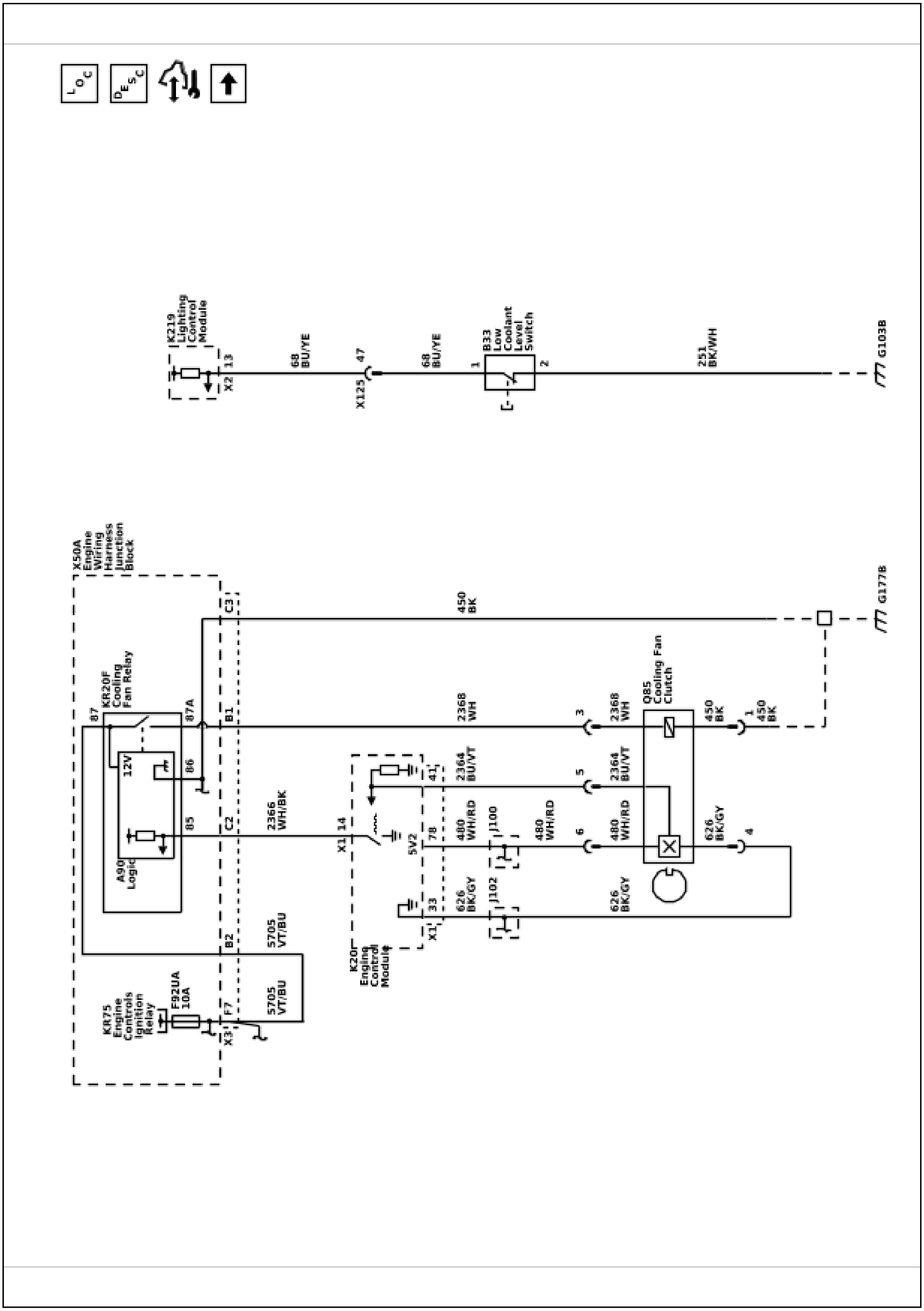
- If the MIL goes out naturally due to 3 passing drive cycles (scan tool code clear is not used), then the Permanent DTC is cleared at power down of the last drive cycle.
- If a scan tool code clear is used to turn off the MIL then the Permanent DTC is not cleared, the DTC must PASS and not FAIL. The Permanent DTC is cleared at power down of the drive cycle.

- If the controller is programmed, all Permanent DTCs are cleared.

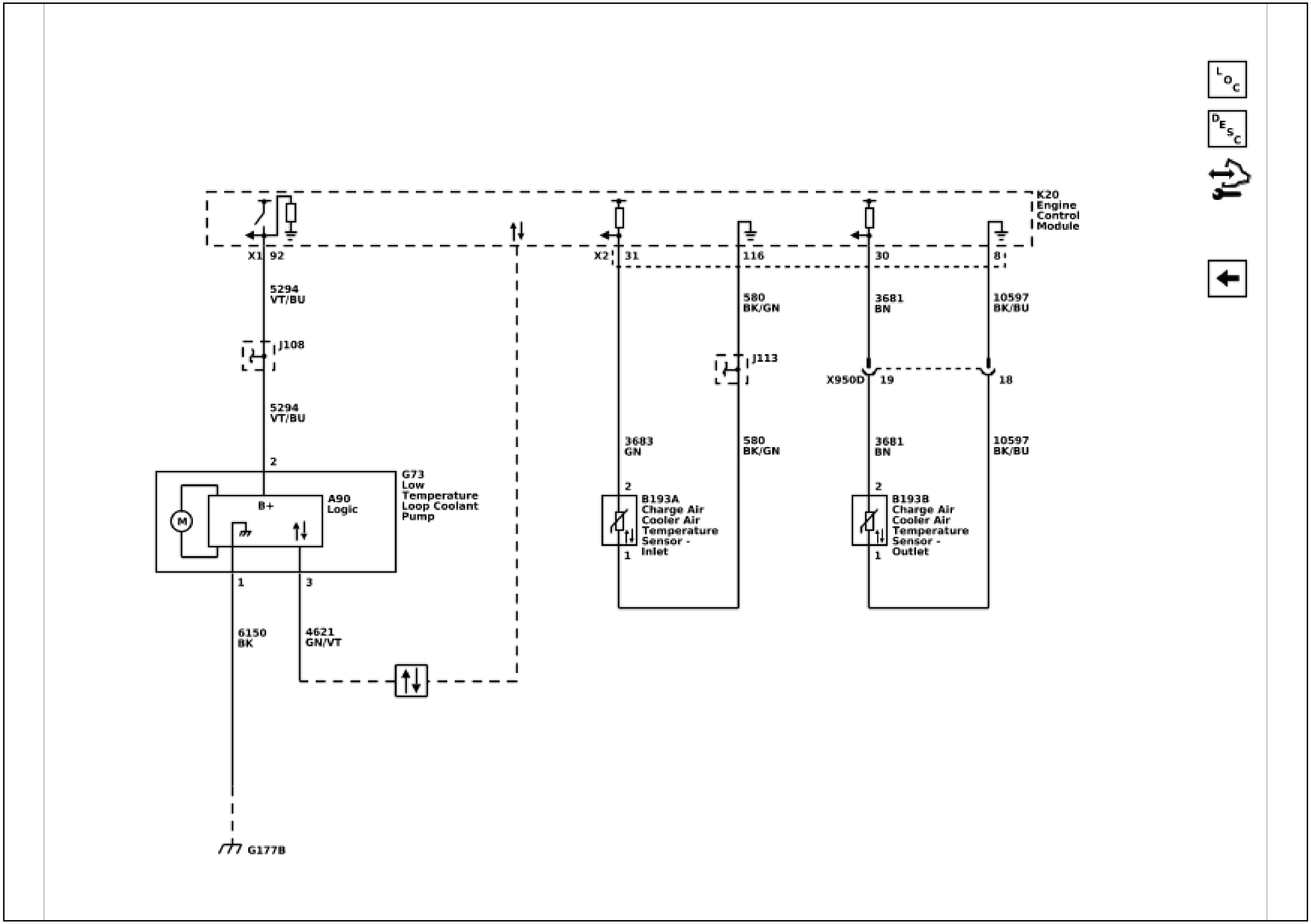
Engine Heating and Cooling

Schematic and Routing Diagrams

Engine Heating/Cooling Schematics (Single Clutch (L5P))


6846285
LOC
DESC
X50A Engine Wiring Harness Junction Block
KR20F Cooling Fan Relay
87
87A
86
85
12V
A90 Logic
KR75 Engine Controls Ignition Relay
F92UA 10A
X3
F7
B2
B1
C2
C3
5705 VT/BU
2366 WH/BK
2368 WH
450 BK
K20 Engine Control Module
X1 14
5V2
78
41
33
X1
2364 BU/VT
480 WH/RD
626 BK/GY
J100
J102
3
5
6
4
1
Q85 Cooling Fan Clutch
G177B
K219 Lighting Control Module
X2 13
68 BU/YE
47
X125
B33 Low Coolant Level Switch
1
2
251 BK/WH
G103B

Engine Heating/Cooling Schematics (Charge Air Cooler (L5P))


K20
Engine
Control
Module
X1 92
5294
VT/BU
J108
5294
VT/BU
2
G73
Low
Temperature
Loop Coolant
Pump
A90
Logic
B+
M
1
3
6150
BK
4621
GN/VT
G177B
X2 31
116
30
8
3683
GN
580
BK/GN
J113
580
BK/GN
3681
BN
X950D 19
18
10597
BK/BU
3681
BN
10597
BK/BU
2
1
B193A
Charge Air
Cooler Air
Temperature
Sensor -
Inlet
2
1
B193B
Charge Air
Cooler Air
Temperature
Sensor -
Outlet
LOC
DESC

6846286

Description and Operation

Cooling Fan Description and Operation (L8T)

Clutch Fan/Cooling Fan Description and Operation

The purpose of the cooling fan is to provide sufficient airflow to meet the vehicle's cooling requirements under any driving condition. The engine is equipped with a bi-metal thermally actuated fan clutch. There is a bi-metallic spring on the face of the clutch that expands and contracts based on a set temperature. The spring movement changes the position of valve that is internal to the clutch assembly. This valve position is used to control the fluid volume inside the clutch plate assembly and modulate the amount of torque transmitted by the clutch. This, in turn, controls the fan speed based on temperature. The clutch assembly is not controlled or monitored by the ECM and is not capable of setting a DTC. The clutch assembly should never be disassembled in an attempt to diagnose or repair it. It should only be replaced as a complete assembly.

Cooling Fan Description and Operation

Cooling Fan Control

The purpose of the electro-viscous (EV) fan clutch is to maintain powertrain cooling requirements. The engine control module (ECM) monitors the following sensors to regulate the fan speed:

- Engine coolant temperature sensor
- A/C refrigerant pressure sensor
- Vehicle speed sensor
- Intake air temperature sensor
- Transmission fluid temperature sensor
- Ambient air temperature sensor
- Cooling fan speed sensor

The ECM controls the EV fan clutch operation. The ECM regulates a 12-volt pulse width modulated signal (PWM) to the cooling fan relay. The PWM signal determines the ON time of the relay. As the ECM command increases, so does the ON time of the relay. The relay ON time directly controls the amount of time the solenoid, which is internal to the fan clutch, is energized. When the solenoid in the fan clutch is energized, it opens the spring loaded valve and allows fluid to flow from the storage chamber to the fluid coupling of the cooling fan clutch, which increases the fan speed. When the solenoid is de-energized, the spring loaded valve closes, and allows the fluid in the coupling of the fan clutch to drain back to the storage chamber, which reduces fan speed. The rapid modulation of the fan clutch solenoid valve gives the ECM the ability to precisely control the amount of fluid that remains in the fluid coupler, allowing more effective regulation of the fan speed and powertrain cooling requirements.

The fan clutch supplies a feedback signal to the ECM, as an actual fan speed input. The fan speed sensor is a hall effect sensor which is internal to the fan clutch. The ECM supplies a 5-volt reference and a low reference to the hall effect sensor. The hall effect sensor returns a signal pulse through the cooling fan speed signal circuit in response to the reluctor track passing by the magnetic field of the hall effect sensor.

The scan tool can operate the cooling fan clutch. This is done through the controls function menu screen. Cooling fan clutch engagement can take up to 2 minutes with a 100 percent command and the engine speed at 2,000 RPM. The lower the engine speed, the longer it will take for the fan to engage. Cooling fan disengagement can take up to 2 minutes with the engine speed at 2,000 RPM. The lower the engine speed, the longer it will take to disengage. In lower ambient air temperatures the cooling fan will engage in less time, however, it will take longer to disengage due to the properties of the fluid vs. temperature.

Under certain conditions the cooling fan may be engaged at engine start. The cooling may have been engaged at the time the engine was turned off. Or, fluid may bleed from the storage chamber into the fluid coupling of the cooling fan clutch while the engine is off. Although the fan clutch is commanded off during a cold start, this is the most likely time a vehicle driver will notice that the fan noise is excessive in comparison to engine starts when the fan clutch is disengaged.

Cooling System Description and Operation

Engine Coolant Indicators

ENGINE COOLANT HOT
The instrument panel cluster (IPC) displays ENGINE COOLANT HOT message when the IPC receives a

message from the powertrain control module (PCM) requesting illumination of this driver warning.

ENGINE OVERHEATED
The IPC displays ENGINE OVERHEATED message when the IPC receives a message from the PCM requesting illumination of this driver warning.

REDUCED ENGINE POWER
The IPC displays REDUCED ENGINE POWER message when the IPC detects a reduced engine power condition from the PCM. The IPC receives a message from the PCM requesting illumination when the engine temperature exceeds a calibrated value.

Coolant Heater (If Equipped)

The optional coolant heater (RPO K05) operates using 110 V AC external power and is designed to warm the coolant in the engine block area for improved starting in very cold weather. The coolant heater also helps reduce fuel consumption when a cold engine is warming up. The unit is equipped with a detachable AC power cord. There is an internal thermal switch in the coolant heater cord that prevents operation above −18°C (0°F). A weather shield on the cord is provided to protect the plug when not in use.

Cooling System

The cooling system's function is to maintain an efficient engine operating temperature during all engine speeds and operating conditions. The cooling system is designed to remove approximately one-third of the heat produced by the burning of the air-fuel mixture. When the engine is cold, the coolant does not flow to the radiator until the thermostat opens. This allows the engine to warm quickly.

Cooling Cycle
Coolant is drawn from the radiator outlet and into the water pump inlet by the water pump. Coolant will then be pumped through the water pump outlet and into the engine block. In the engine block, the coolant circulates through the water jackets surrounding the cylinders, where it absorbs heat.

Some coolant is also pumped from the water pump to the heater core, then back to the water pump. This provides the passenger compartment with heat and defrost.

The coolant is then forced through the cylinder head gasket openings and into the cylinder heads. In the cylinder heads, the coolant flows through the water jackets surrounding the combustion chambers and valve seats, where it absorbs additional heat.

Coolant
The engine coolant is a solution made up of a 50-50 mixture of DEX-COOL and suitable drinking water. The coolant solution carries excess heat away from the engine to the radiator, where the heat is dissipated to the atmosphere.

Radiator
The radiator is a heat exchanger. It consists of a core and two tanks. The aluminum core is a tube and fin crossflow design that extends from the inlet tank to the outlet tank. Fins are placed around the outside of the tubes to improve heat transfer to the atmosphere.

The inlet and outlet tanks are a molded, high temperature, nylon reinforced plastic material. A high temperature rubber gasket seals the tank flange edge to the aluminum core. The tanks are clamped to the core with clinch tabs. The tabs are part of the aluminum header at each end of the core.

The radiator also has a drain cock located in the bottom of the right hand tank (L5P) and left hand tank (L8T). The drain cock unit includes the drain cock and drain cock seal.

The radiator removes heat from the coolant passing through it. The fins on the core transfer heat from the coolant passing through the tubes. As air passes between the fins, it absorbs heat and cools the coolant.

Radiator Surge Tank and Radiator Surge Tank Cap
The surge tank is a plastic tank with a threaded pressure cap that contains a blow off or pressure relief valve, vacuum or atmospheric valve and seals the cooling system. The tank is mounted at a point higher than all other coolant passages. The surge tank provides an air space in the cooling system that allows the coolant to expand and contract. The surge tank provides a coolant fill point and a central air bleed location. The cap pressure valve is held against its seat by a spring, which protects the radiator from excessive cooling system pressure. The vacuum valve is held against its seat by a spring, which permits opening of the valve to relieve vacuum created in the cooling system as it cools off.

During vehicle use, the coolant heats and expands. The pressure cap allows cooling system pressure to build up as the temperature increases. As the pressure builds, the boiling point of the coolant increases. Engine coolant can be safely run at a temperature much higher than the boiling point of the coolant at atmospheric pressure. The hotter the coolant is, the faster the heat transfers from the radiator to the cooler, passing air. Increased coolant volume flows into the surge tank. If the pressure in the cooling system exceeds the rating of the pressure cap, it raises the pressure valve, venting the excess pressure through a channel into the overflow bottle. As the coolant circulates, the air is allowed to bubble out. This air is then transferred to the overflow bottle, through the surge tank cap, where it returns to the atmosphere. Coolant without air bubbles absorbs heat much better than coolant with bubbles. When the engine cools, the coolant, without air bubbles, contracts back into the surge tank from the bottom of the overflow bottle and a vacuum is created in the cooling system. This vacuum causes the vacuum valve to open, allowing outside air into the radiator surge tank. This equalizes the pressure in the cooling system with atmospheric pressure, preventing the radiator and coolant hoses from collapsing.

Air Baffles and Seals

The cooling system uses deflectors, air baffles and air seals to increase cooling system capability. Deflectors are installed under the vehicle to redirect airflow beneath the vehicle and through the radiator to increase engine cooling. Air baffles are also used to direct airflow through the radiator and increase cooling capability. Air seals prevent air from bypassing the radiator and A/C condenser, and prevent recirculation of hot air for better hot weather cooling and A/C condenser performance.

Transmission Oil Cooler

The transmission oil cooler is a heat exchanger. It is located inside the right side end tank of the radiator. The transmission fluid temperature is regulated by the temperature of the engine coolant that surrounds the oil cooler as the transmission fluid passes through the cooler.

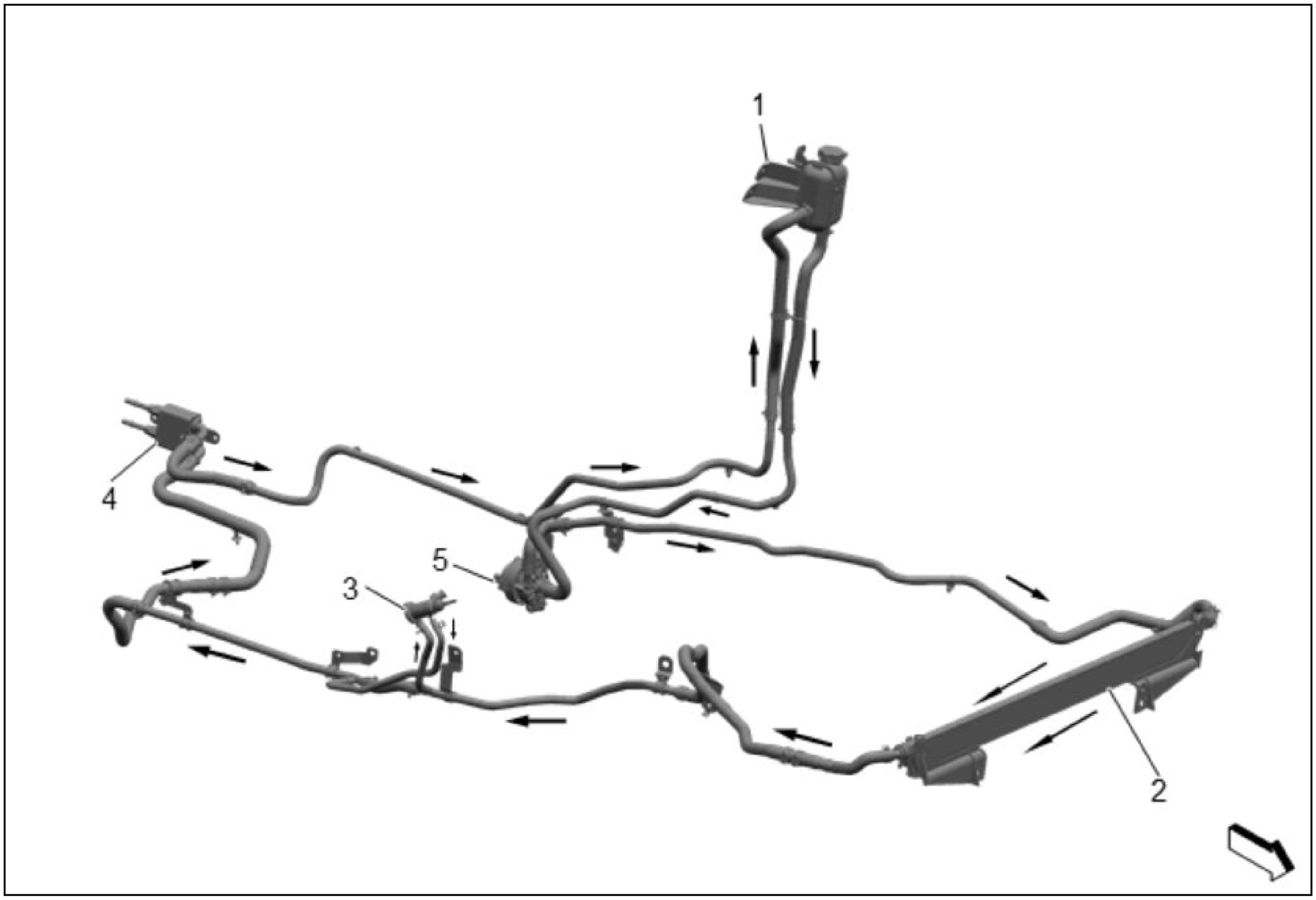
The transmission oil pump, pumps the fluid through the transmission oil cooler feed line to the oil cooler. The fluid then flows through the cooler while the engine coolant absorbs heat from the fluid. The fluid is then pumped through the transmission oil cooler return line, to the transmission.

Engine Oil Cooler (If Equipped)

The engine oil cooler is a heat exchanger located inside the left side end tank of the radiator. The engine oil temperature is controlled by the temperature of the engine coolant that surrounds the oil cooler in the radiator.

The engine oil pump, pumps the oil through the engine oil cooler line to the oil cooler. The oil then flows through the cooler where the engine coolant absorbs heat from the oil. The oil is then pumped through the oil cooler return line, to the engine block system.

Auxiliary Cooling System (L5P)



5300775

The Auxiliary Cooling System is a low-temperature system designed to carry heat away from diesel fuel system components. The system maintains optimum fuel temperature, since diesel high pressure fuel injection systems create additional heat, and unused return fuel is carried back to the fuel tank at a much higher temperature.

The Auxiliary Cooling System also provides cooling for the Emissions Reductions Fluid Injector (3), since the injector cycle time in certain operating conditions can generate excessive heat.

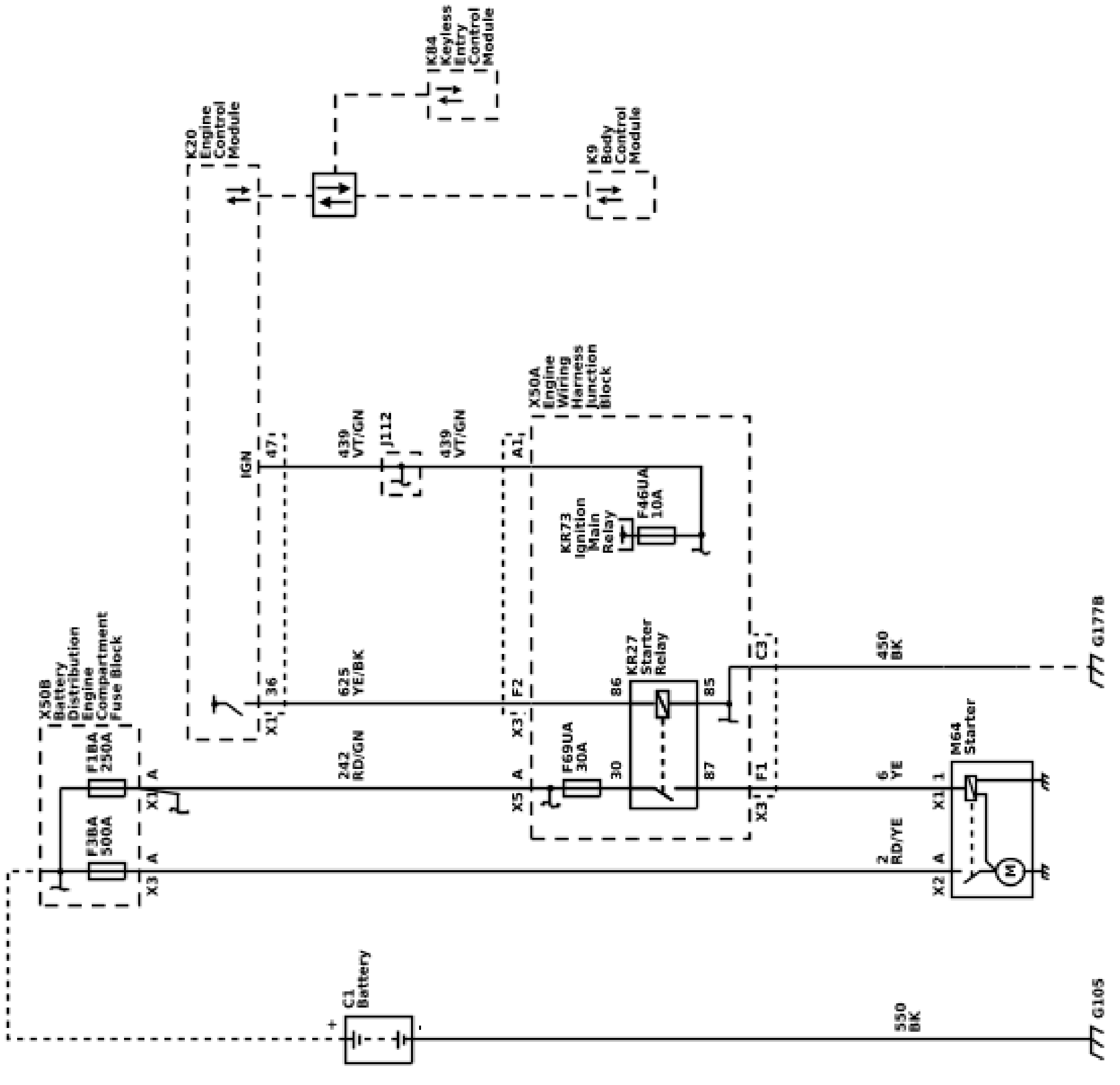
The Auxiliary Cooling system uses the following primary components to reduce the temperature of diesel fuel system components:

- Heater Coolant Pump (5) circulates coolant through the fuel cooling system at a flow rate determined by operating conditions and engine control logic.
- Fuel Cooler (4) mounted forward of the fuel tank reduces the temperature of return fuel before it re-enters the tank to be used once again in the fuel feed circuit.
- Engine Auxiliary Radiator (2) removes heat from the fuel cooling system, transferring heat to the atmosphere.
- Fuel Cooler Coolant Surge Tank (1) allows for expansion and contraction of coolant due to flow and temperature. Also provides visible level indicator for maintaining proper coolant level and quantity.

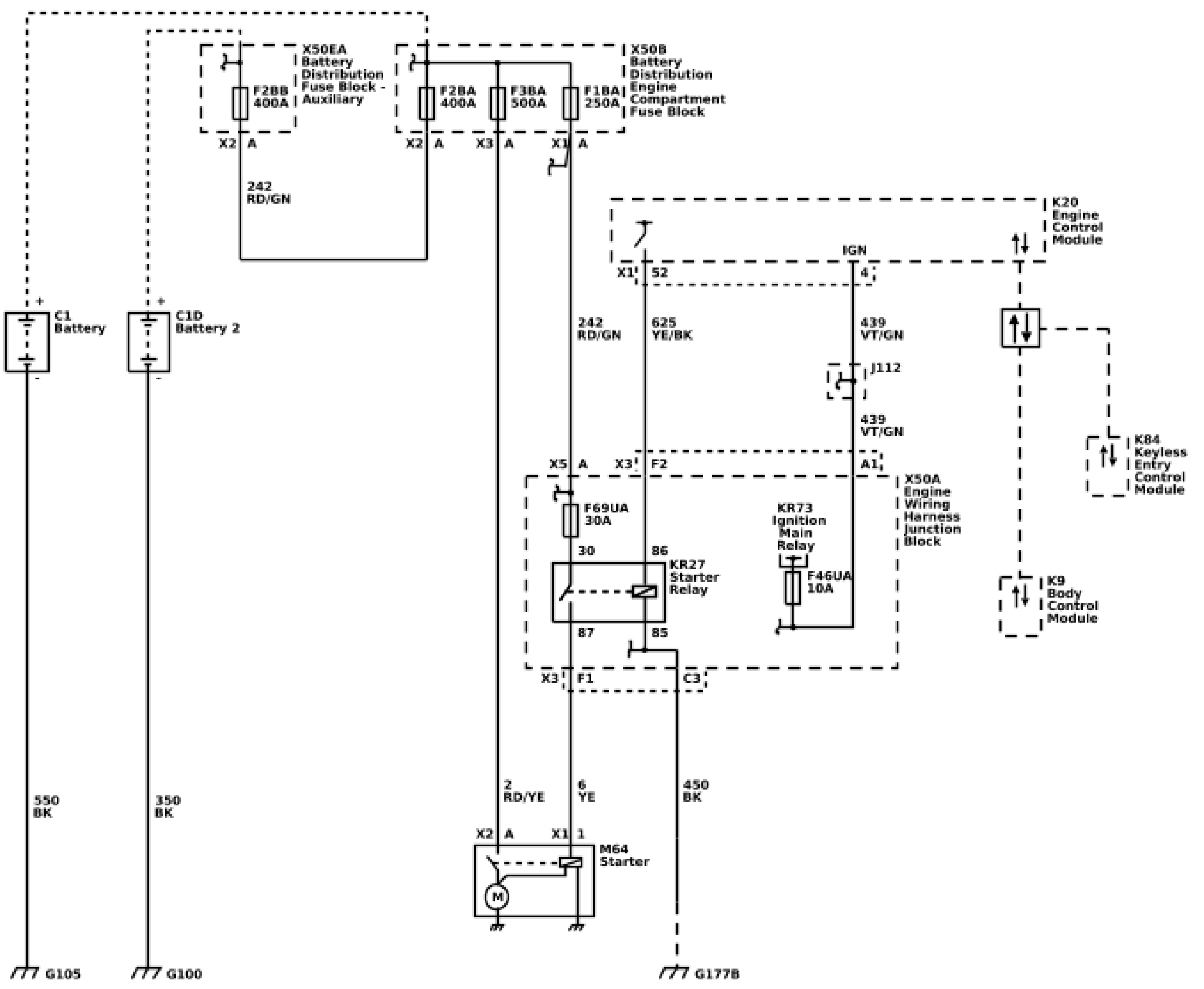
Starting, Charging, and Low Voltage Energy Storage

Schematic and Routing Diagrams

Starting and Charging Schematics (Starting (L8T))


6846243
X50B Battery Distribution Engine Compartment Fuse Block
F18A 250A
F38A 500A
X1 A
X3 A
K20 Engine Control Module
IGN
47
36
X1
242 RD/GN
439 VT/GN
J112
439 VT/GN
A1
F2
X3
X5 A
625 YE/BK
K84 Keyless Entry Control Module
K9 Body Control Module
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F46UA 10A
KR27 Starter Relay
86
85
30
87
F69UA 30A
C3
F1
X3
450 BK
G177B
6 YE
X1 1
M64 Starter
2 RD/YE
X2 A
C1 Battery
+
-
550 BK
G105

Starting and Charging Schematics (Starting (L5P))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F2BB 400A
X2 A
242 RD/GN
X50B Battery Distribution Engine Compartment Fuse Block
F2BA 400A
F3BA 500A
F18A 250A
X2 A
X3 A
X1 A
C1 Battery
C1D Battery 2
+
-
550 BK
350 BK
G105
G100
K20 Engine Control Module
IGN
X1 52
4
242 RD/GN
625 YE/BK
439 VT/GN
J112
439 VT/GN
X5 A
X3 F2
A1
X50A Engine Wiring Harness Junction Block
F69UA 30A
30
86
KR27 Starter Relay
87
85
KR73 Ignition Main Relay
F46UA 10A
X3 F1
C3
K84 Keyless Entry Control Module
K9 Body Control Module
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6 YE
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M64 Starter
M
G177B

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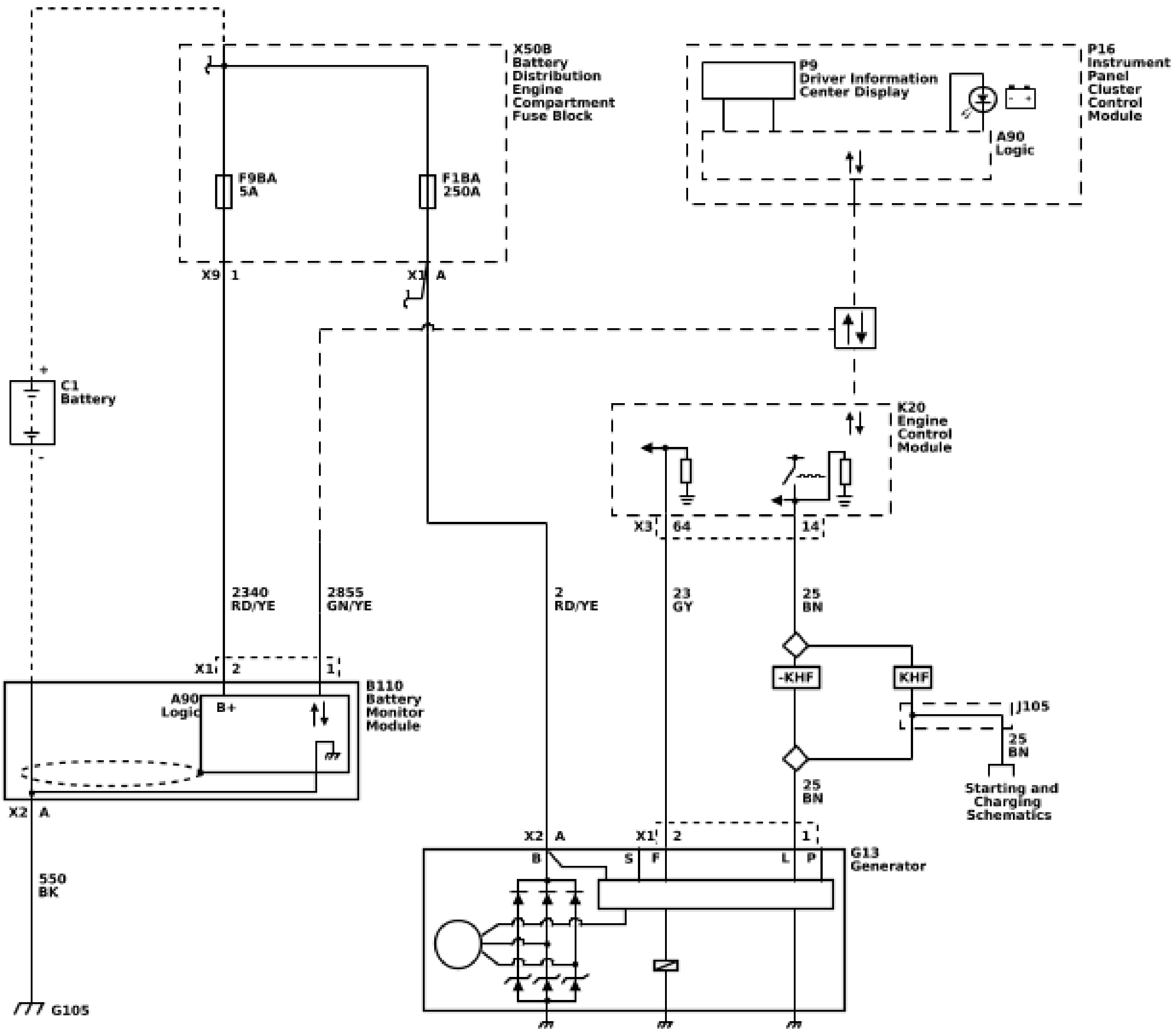
Starting and Charging Schematics (Charging (L8T))


X50B
Battery
Distribution
Engine
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Fuse Block
F9BA
5A
F1BA
250A
X9 1
X1 A
P16
Instrument
Panel
Cluster
Control
Module
P9
Driver Information
Center Display
A90
Logic
C1
Battery
+
-
K20
Engine
Control
Module
X3 64
14
2340
RD/YE
2855
GN/YE
2
RD/YE
23
GY
25
BN
-KHF
KHF
J105
25
BN
Starting and
Charging
Schematics
X1 2
1
B110
Battery
Monitor
Module
A90
Logic
B+
X2 A
550
BK
G105
X2 A
X1 2
1
B
S
F
L
P
G13
Generator
25
BN

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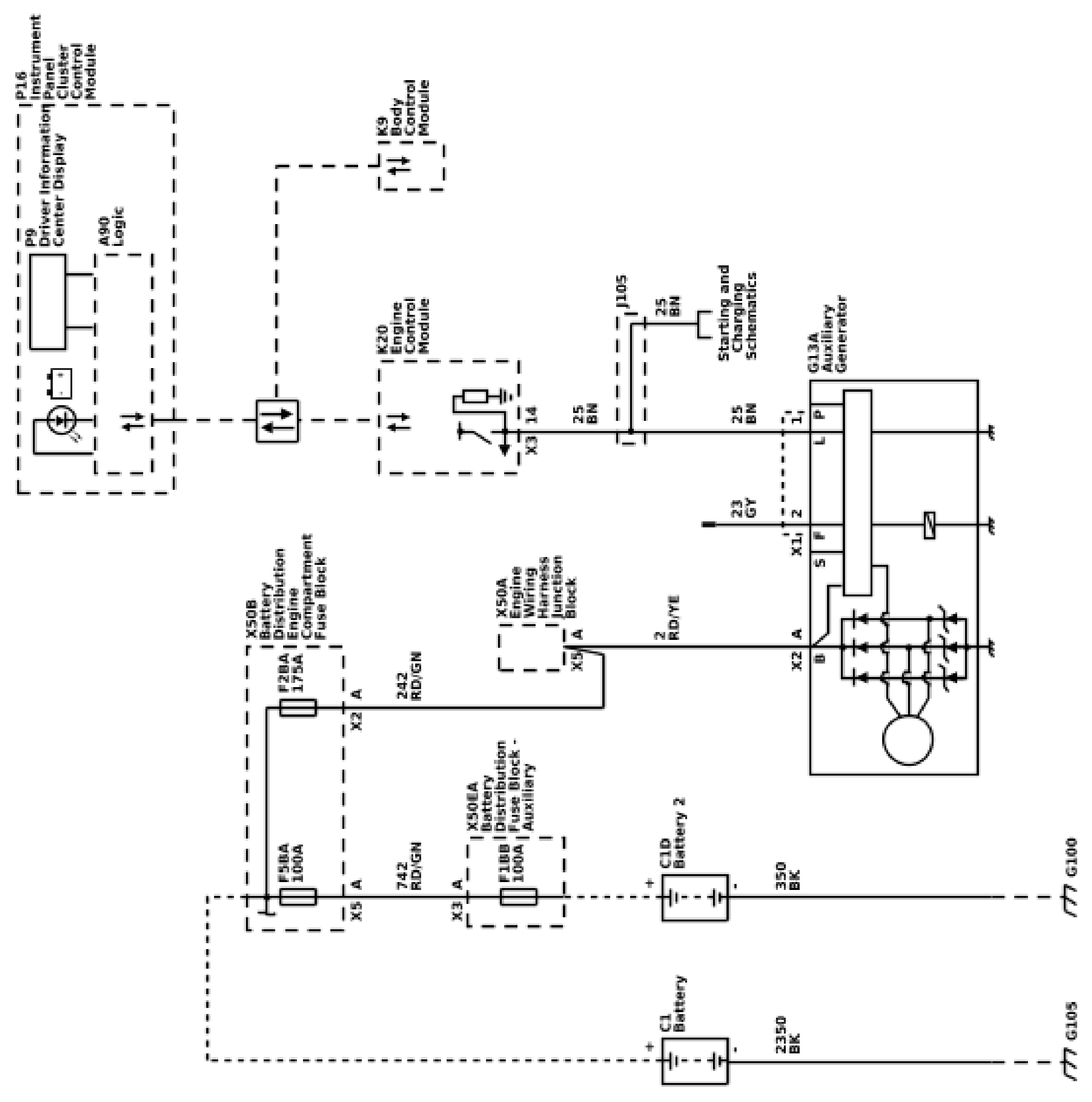
Starting and Charging Schematics (Charging Auxiliary (L8T))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A90 Logic
K9 Body Control Module
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25 BN
J105
25 BN
Starting and Charging Schematics
G13A Auxiliary Generator
1 P
L
2 F
X1
S
23 GY
X50B Battery Distribution Engine Compartment Fuse Block
F28A 175A
X2 A
242 RD/GN
X50A Engine Wiring Harness Junction Block
X5 A
2 RD/YE
X2 A B
F58A 100A
X5 A
742 RD/GN
X50EA Battery Distribution Fuse Block - Auxiliary
X3 A
F1BB 100A
C1D Battery 2
+
-
350 BK
G100
C1 Battery
2350 BK
G105

Starting and Charging Schematics (Charging (L5P))

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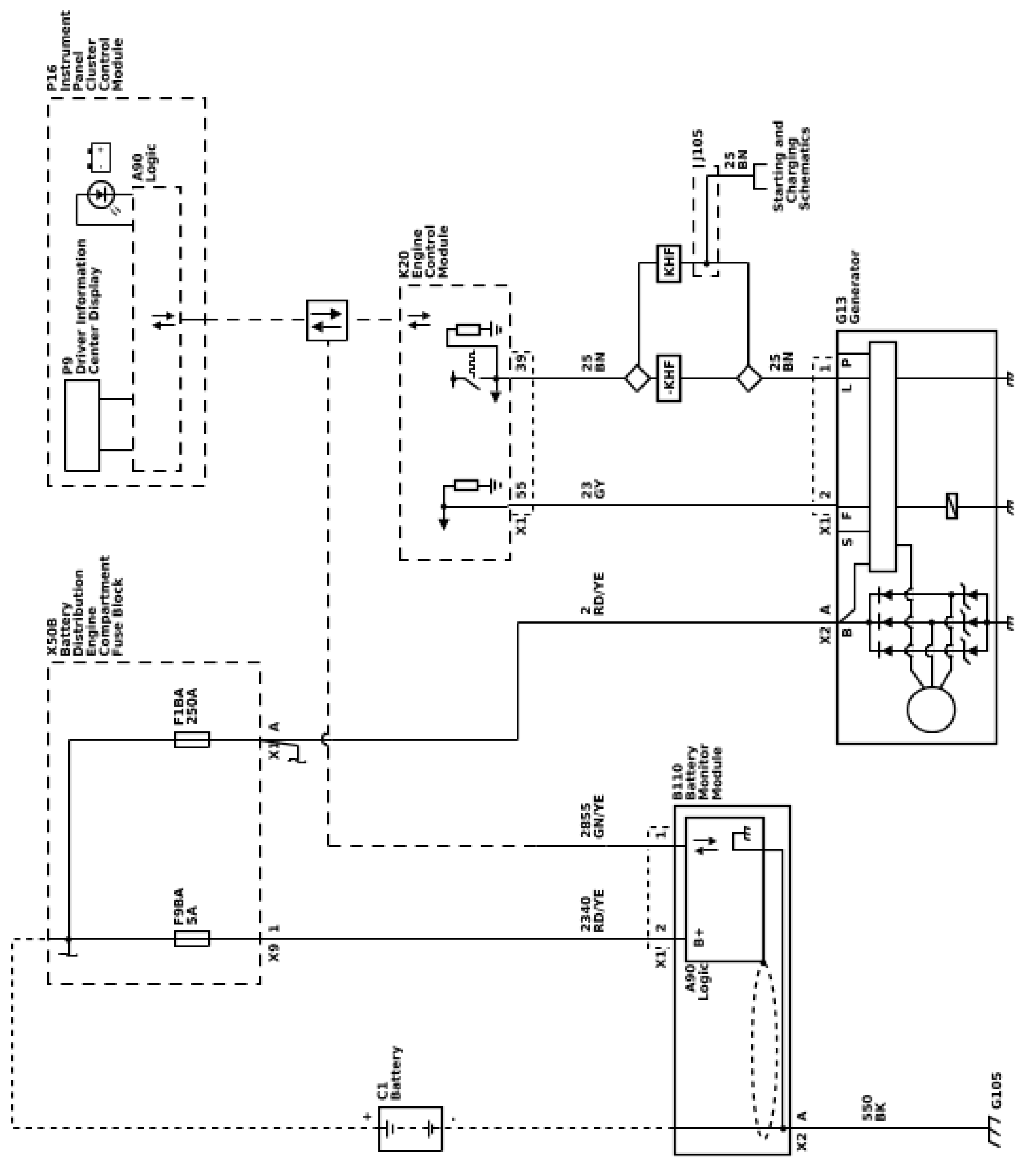
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X1
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25 BN
Starting and Charging Schematics
KHF
-KHF
25 BN
23 GY
2 RD/YE
G13 Generator
1
2
X1
P
L
F
S
A
B
X2
X50B Battery Distribution Engine Compartment Fuse Block
F18A 250A
F9BA 5A
X1 A
X9 1
B110 Battery Monitor Module
2855 GN/YE
2340 RD/YE
1
2
X1
B+
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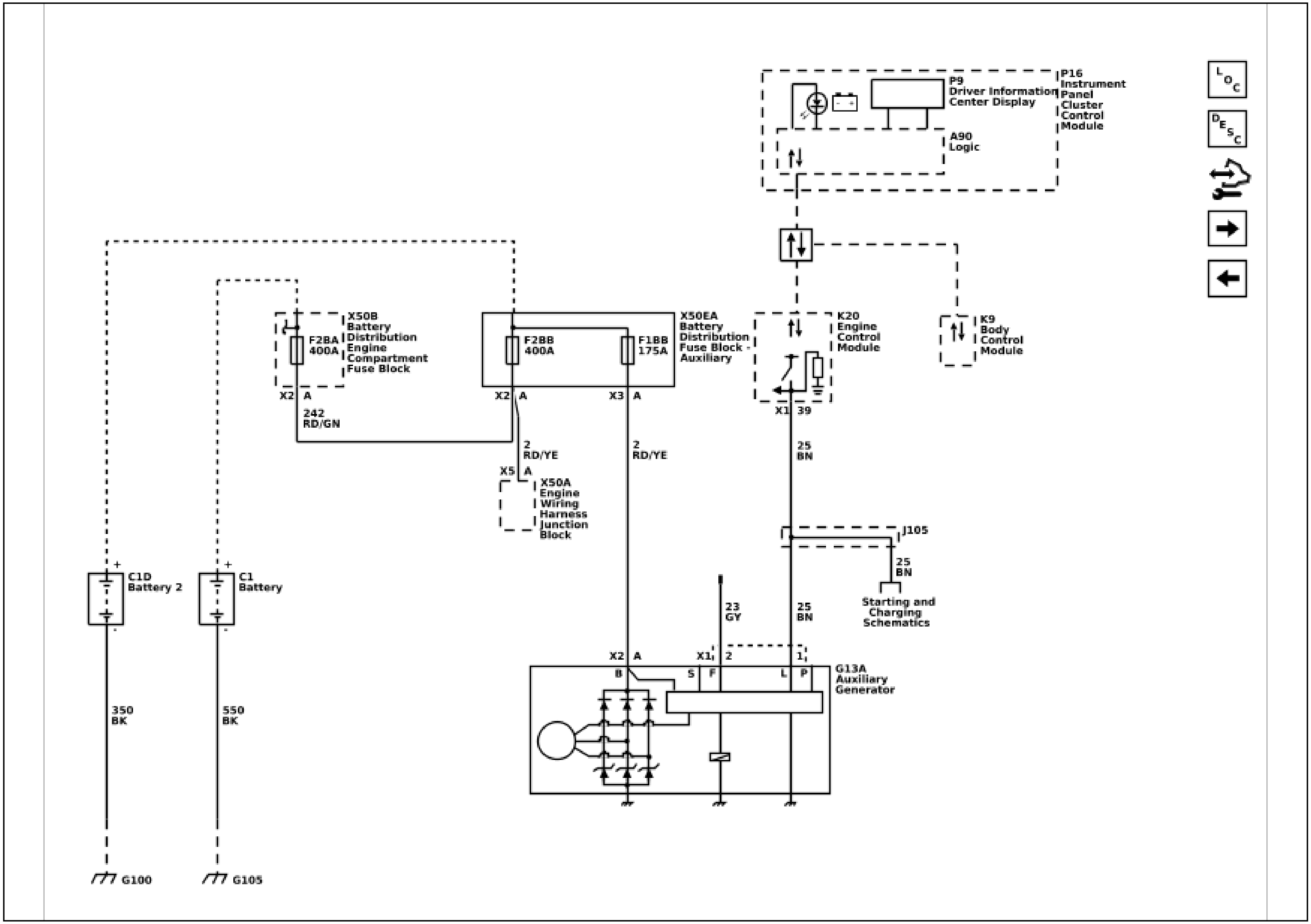
C1 Battery
+
-
X2 A
550 BK
G105

Starting and Charging Schematics (Charging Auxiliary (L5P))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P9 Driver Information Center Display
A90 Logic
K9 Body Control Module
K20 Engine Control Module
X1 39
25 BN
J105
25 BN
Starting and Charging Schematics
X50B Battery Distribution Engine Compartment Fuse Block
F2BA 400A
X2 A
242 RD/GN
X50EA Battery Distribution Fuse Block - Auxiliary
F2BB 400A
F1BB 175A
X2 A
X3 A
2 RD/YE
2 RD/YE
X5 A
X50A Engine Wiring Harness Junction Block
23 GY
25 BN
X2 A
X1 2
1
B
S
F
L
P
G13A Auxiliary Generator
+
C1D Battery 2
-
+
C1 Battery
-
350 BK
550 BK
G100
G105

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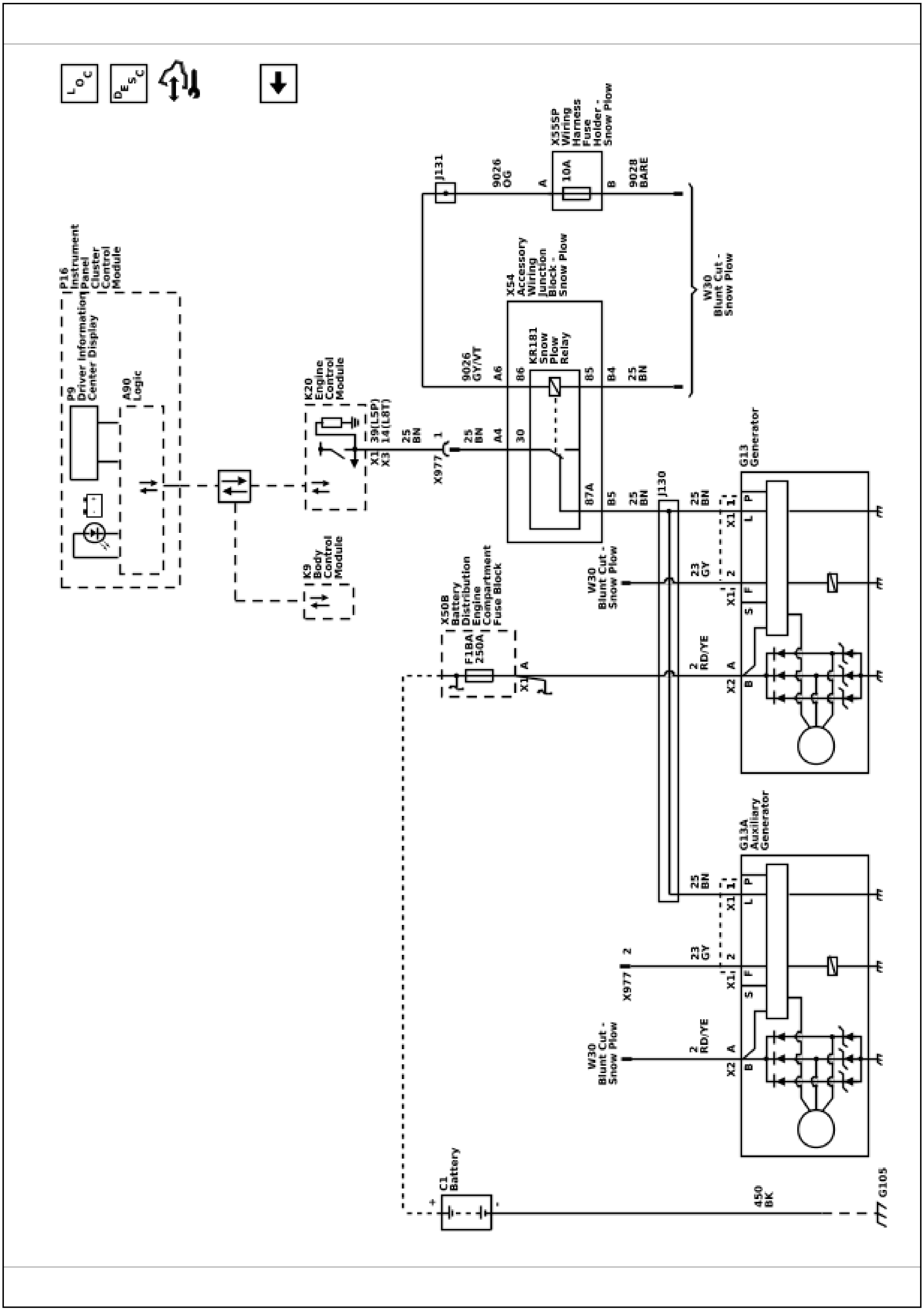
Starting and Charging Schematics (Charging (VYU))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LOC
DESC
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P9 Driver Information Center Display
A90 Logic
K20 Engine Control Module
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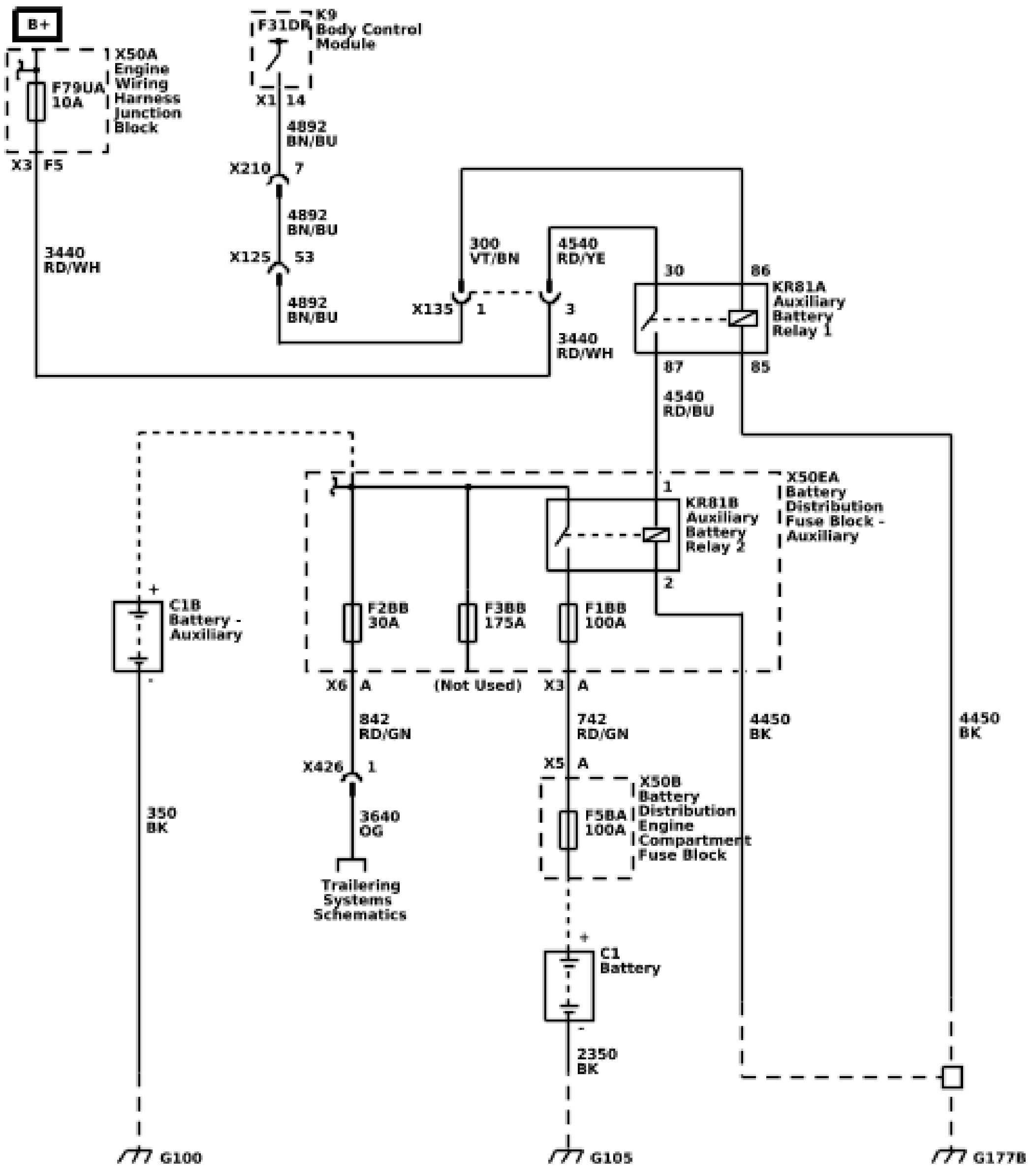
X3 14(L8T)
25 BN
1
X977
25 BN
A4
30
X54 Accessory Wiring Junction Block - Snow Plow
9026 GY/VT
A6
86
KR181 Snow Plow Relay
85
B4
25 BN
87A
B5
25 BN
J131
9026 OG
A
10A
B
9028 BARE
X55SP Wiring Harness Fuse Holder - Snow Plow
W30 Blunt Cut - Snow Plow
K9 Body Control Module
X50B Battery Distribution Engine Compartment Fuse Block
F18A 250A
X1 A
J130
25 BN
X1 1
P
L
G13 Generator
W30 Blunt Cut - Snow Plow
23 GY
2
X1
F
S
2 RD/YE
A
X2
B
G13A Auxiliary Generator
25 BN
X1 1
P
L
X977 2
23 GY
2
X1
F
S
W30 Blunt Cut - Snow Plow
2 RD/YE
A
X2
B
C1 Battery
+
-
450 BK
G105

Auxiliary Battery Schematics (Auxiliary Battery Relays (K4Z))


B+
X50A Engine Wiring Harness Junction Block
F79UA 10A
X3 F5
3440 RD/WH
K9 Body Control Module
F31DR
X1 14
4892 BN/BU
X210 7
4892 BN/BU
X125 53
4892 BN/BU
300 VT/BN
X135 1
4540 RD/YE
3
3440 RD/WH
30
86
KR81A Auxiliary Battery Relay 1
87
85
4540 RD/BU
1
KR81B Auxiliary Battery Relay 2
2
X50EA Battery Distribution Fuse Block - Auxiliary
C1B Battery - Auxiliary
+
-
F2BB 30A
F3BB 175A
F1BB 100A
X6 A
(Not Used)
X3 A
842 RD/GN
742 RD/GN
4450 BK
4450 BK
X426 1
X5 A
3640 OG
X50B Battery Distribution Engine Compartment Fuse Block
F5BA 100A
Trailering Systems Schematics
350 BK
C1 Battery
+
-
2350 BK
G100
G105
G177B

6846250

Description and Operation

Battery Description and Operation

Warning: Batteries produce explosive gases, contain corrosive acid, and supply levels of electrical current high enough to cause burns. Therefore, to reduce the risk of personal injury when working near a battery:

- ***Always shield your eyes and avoid leaning over the battery whenever possible.***
- ***Do not expose the battery to open flames or sparks.***
- ***Do not allow the battery electrolyte to contact the eyes or the skin. Flush immediately and thoroughly any contacted areas with water and get medical help.***
- ***Follow each step of the jump starting procedure in order.***
- ***Treat both the booster and the discharged batteries carefully when using the jumper cables.***

Batteries that are no longer wanted must be disposed of by an approved battery recycler and must never be thrown in the trash or sent to a landfill.

Batteries that are not part of the vehicle itself, not the battery under the hood, must only be transported on public streets for business purposes via approved hazardous material transportation procedures.

Battery storage, charging and testing facilities in repair shops must meet various requirements for ventilation, safety equipment, material segregation, etc.

The maintenance free battery is standard. There are no vent plugs in the cover. The battery is completely sealed except for 2 small vent holes in the side. These vent holes allow the small amount of gas that is produced in the battery to escape.

The battery has 3 functions as a major source of energy:

- Engine cranking
- Voltage stabilizer
- Alternate source of energy with generator overload

Battery Low Start Vehicle Message

The body control module (BCM) monitors battery positive voltage to determine battery state of charge. If one or more of the BCM battery positive voltage terminals measure less than approximately 11.6V compared to the BCM ground circuits, this message will display and four chimes may sound. Start the vehicle immediately. If the vehicle is not started and the battery continues to discharge, the climate controls, heated seats, and audio systems will shut off and the vehicle may require a jump start. These systems will function again after the vehicle is started.

Battery Ratings

A battery has 2 ratings:

- Cold cranking amperage
- Amperage hours

When a battery is replaced use a battery with similar ratings. See battery specification label on the original battery.

Amperage Hours

The amperage hour rating tells you how much amperage is available when discharged evenly over a 20 hour period. The amperage hour rating is cumulative, so in order to know how much constant amperage the battery will output for 20 h, you have to divide the amperage hour rating by 20. Example: If a battery has an amperage hour rating of 74, dividing by 20 = 3.75. Such a battery can carry a 3.75 A load for 20 hours before dropping to 10.5 V. (10.5 V is the fully discharged level, at which point the battery needs to be recharged). A battery with an amperage hour rating of 55 will carry a 2.75 A load for 20 hours before dropping to 10.5 V.

Cold Cranking Amperage

The cold cranking amperage is an indication of the ability of the battery to crank the engine at cold temperatures. The cold cranking amperage rating is the minimum amperage the battery must maintain for 30 seconds at −18°C (0°F) while maintaining at least 7.2 V. See battery label for the cold cranking amperage rating of this battery.

Charging System Description and Operation

Electrical Power Management Overview

The electrical power management system is designed to monitor and control the charging system and send diagnostic messages to alert the driver of possible problems with the battery and generator. This electrical power management system primarily utilizes existing on-board computer capability to maximize the effectiveness of the generator, to manage the load, improve battery state-of-charge and life, and minimize the system's impact on fuel economy. The electrical power management system performs 3 functions:

- Monitor the battery voltage and estimate the battery condition
- Take corrective actions by boosting idle speeds, and adjusting the regulated voltage
- Perform diagnostics and driver notification

The battery condition is estimated during ignition/vehicle off and during ignition/vehicle on. During ignition/vehicle off the state-of-charge of the battery is determined by measuring the open-circuit voltage. The state-of-charge is a function of the acid concentration and the internal resistance of the battery, and is estimated by reading the battery open circuit voltage when the battery has been at rest for several hours.

Any time the ignition/vehicle is on, the vehicle algorithm continuously estimates battery state-of-charge based on adjusted net amp hours, battery capacity, initial state-of-charge, and calculated temperature.

While the engine is running, the battery degree of discharge is primarily determined by the integrated battery current sensor, to obtain net amp hours.

In addition, the electrical power management function is designed to perform regulated voltage control to improve battery state-of-charge, battery life, and fuel economy. This is accomplished by using knowledge of the battery state-of-charge and temperature to set the charging voltage to an optimum battery voltage level for recharging without detriment to battery life.

Charging System Components

Generator
The engine drive belt drives the generator. When the rotor is spun, it induces an alternating current (AC) into the stator windings. The AC voltage is then sent through a series of diodes for rectification. The rectified voltage has been converted into a direct current (DC) for use by the vehicles electrical system to maintain electrical loads and the battery charge.
The voltage regulator integral to the generator controls the output of the generator; It is not serviceable.
The voltage regulator controls the amount of current provided to the rotor. If the generator has field control circuit fault, the generator defaults to an output voltage of 13.8 V.

The generator is serviced as a complete assembly. If there is a diagnosed fault in the generator, it must be replaced as an assembly.

Generator Pulley
The pulley drives the Generator via the engine drive belt. There are 2 types of pulleys:

1. Conventional solid Pulley which is bolted to the Generator stator shaft. This Pulley can be serviced separately.

2. One Way Clutch Pulley or Overrunning Alternator Decoupler Pulley allows the Generator to spin freely when the engine rapidly slows down on sudden deceleration. This part is not serviceable and the Generator needs to be replaced as an assembly.

Body Control Module (BCM)
The BCM communicates with the Engine Control Module (ECM) and the instrument cluster for electrical power management operation. The BCM determines the output of the generator and sends the information to the ECM for control of the generator turn on signal circuit. It monitors the generator field duty cycle signal circuit information sent from the ECM for control of the generator. It monitors the battery current sensor, the battery positive voltage circuit, and estimates battery temperature to determine battery state of charge. The BCM also performs idle boost.

Battery Sensor Module (if applicable)
The BCM monitors the Battery Sensor Module for battery state of current, state of health, and battery charge via serial data. If the battery is determined to be in poor state of health or having a low state of charge, the BCM will not allow the ECM to perform an auto-stop.

Engine Control Module (ECM)
When the engine is running, the generator turn-on signal is sent to the generator from the ECM, turning on the regulator. The generator's voltage regulator controls current to the rotor, thereby controlling the output voltage. The rotor current is proportional to the electrical pulse width supplied by the regulator. When the engine is started, the regulator senses generator rotation by detecting AC voltage at the stator through an internal wire. Once the engine is running, the regulator varies the field current by controlling the pulse width. This regulates the generator output voltage for proper battery charging and electrical system operation. The generator field duty terminal is connected internally to the voltage regulator and externally to the ECM. When the voltage regulator detects a charging system problem, it grounds this circuit to signal the ECM that a problem exists. The ECM monitors the generator field duty cycle signal circuit,

and receives control decisions based on information from the BCM.

Instrument Cluster
As a means of displaying the charging system functions, some vehicles may be equipped with a voltmeter gauge on the instrument cluster and/or a system voltage display in the driver information center. These will indicate the current vehicle system voltage.

The instrument cluster also provides customer notification if there is a concern with the charging system. There are two means of notification: a charge indicator on the instrument cluster and/or a service system message displayed on the Driver Information Center (DIC) if equipped.

Charging System Operation

The purpose of the charging system is to maintain the battery charge and vehicle loads. There are 6 modes of operation and they include:

- Battery Sulfation Mode
- Charge Mode
- Fuel Economy Mode
- Head lamp Mode
- Start Up Mode
- Voltage Reduction Mode

The ECM Controls the Generator through the generator turn–on signal circuit, also known as the Generator L-terminal. The ECM monitors the generator performance though the Generator field duty cycle signal circuit, also known as the generator F-terminal.

The Generator turn–on signal (Generator L-terminal) is a Pulse Width Modulation (PWM) signal of 128 Hz with a duty cycle of 0–100%. Normal duty cycle is between 5–95%. 0–5% and 95–100% are for diagnostic purposes, with 0–5% monitoring for an open circuit and 95–100% monitoring for a short to ground at a fixed 13.8 V. The following table shows the commanded duty cycle and output voltage of the Generator:

Commanded Duty Cycle	Generator Output Voltage (+/- .25 V)
0–5%	13.8 V
10%	11 V
20%	11.56 V
30%	12.13 V
40%	12.69 V
50%	13.25 V
60%	13.81 V
70%	14.38 V
80%	14.94 V
90%	15.5 V
95–100%	13.8 V

The Generator provides a PWM feedback signal of the Generator voltage output through the Generator field duty cycle signal circuit to the ECM. This information is sent to the Body Control Module (BCM). The Generator field duty cycle signal (Generator F-terminal) is a PWM signal of 60–460 Hz with a duty cycle of 0–100%. Normal duty cycle is between 5–100%. 0–5% is reserved for diagnostic purposes.

As the charging systems works to maintain the battery charge and manage vehicle electrical loads, it is normal for the voltmeter gauge on the instrument cluster or the system voltage displayed in the DIC to fluctuate or change. This does not indicate a malfunction. Depending on the battery state of charge and the vehicle electrical load, these values may be anywhere from 12.5 V to 15.5 V.

Charging System Modes

Battery Sulfation Mode
The BCM will enter this mode when the interpreted Generator output voltage is less than 13.2 V for 45 minutes. When this condition exists the BCM will enter Charge Mode for 2–3 minutes. The BCM will then determine which mode to enter depending on voltage requirements.

Charge Mode
The BCM will enter Charge Mode when ever one of the following conditions are met:

- Windshield wipers are ON for more than 3 s.
- Climate Control Voltage Boost Mode Request is true, as sensed by the HVAC control module via serial data. High speed cooling fan, rear defogger, and HVAC high speed blower operation can cause the BCM to enter the Charge Mode.
- The estimated battery temperature is less than 0°C (32°F).
- Battery State of Charge is less than 80%.
- Vehicle speed is greater than 145 km/h (90 mph)
- A current sensor malfunction exists.
- System voltage is determined to be below 12.56 V

When any one of these conditions is met, the system will set targeted generator output voltage to a charging voltage between 13.9–15.5 V, depending on the battery state of charge and estimated battery temperature.

Fuel Economy Mode

The BCM will enter Fuel Economy Mode when the estimated battery temperature is at least 0°C (32°F) but less than or equal to 80°C (176°F), the calculated battery current is less than 15 A and greater than −8 A, and the battery state-of-charge is greater than or equal to 80%. Its targeted generator output voltage is the open circuit voltage of the battery and can be between 12.5–13.1 V. When fuel economy mode is active, the generator is not charging, only maintaining open circuit battery voltage. The BCM will exit this mode and enter Charge Mode when any of the conditions described above are present.

Headlamp Mode

The BCM will enter Headlamp Mode when ever the head lamps are ON (high or low beams). Voltage will be regulated between 13.9–14.5 V.

Start Up Mode

When the engine is started the BCM sets a targeted generator output voltage of 14.5 V for 30 s.

Tow/Haul Mode (if applicable)

Pressing the Tow/Haul Mode button located on the center stack, the vehicle system voltage is raised and the remote (non-vehicle) battery will be charged. Having the headlamps on will raise the system voltage and if the Tow/Haul button is applied it will not serve any purpose. The voltage is regulated between 13.9-14.5 V.

Instrument Cluster Operation

Charge Indicator Operation

The instrument cluster illuminates the charge indicator and displays a warning message in the driver information center if equipped, when the one or more of the following occurs:

- The ECM detects that the generator output is less than 11 V or greater than 16 V. The instrument cluster receives a serial data message from the ECM requesting illumination.
- The instrument cluster determines that the system voltage is less than 11 V or greater than 16 V for more than 30 s. The instrument cluster receives a serial data message from the BCM indicating there is a system voltage range concern.
- The instrument cluster performs the displays test at the start of each ignition cycle. The indicator illuminates for approximately 3 s.

Driver Information Center Message: BATTERY NOT CHARGING SERVICE CHARGING SYSTEM or SERVICE BATTERY CHARGING SYSTEM

The BCM and the ECM will send a serial data message to the driver information center for the BATTERY NOT CHARGING SERVICE CHARGING SYSTEM or SERVICE BATTERY CHARGING SYSTEM message to be displayed. It is displayed when a charging system DTC is a current DTC. The message is turned off when the conditions for clearing the DTC have been met.

Voltmeter Gauge and/or System Voltage Display (if equipped)

As a means of displaying the charging system functions, some vehicles may be equipped with a voltmeter gauge on the instrument cluster and/or a system voltage display in the driver information center. These will indicate the current vehicle system voltage.

As the charging systems works to maintain the battery charge and manage vehicle electrical loads, it is normal for the voltmeter gauge on the instrument cluster or the system voltage display in the driver information center to fluctuate or change. This does not indicate a malfunction. Depending on the battery state of charge and the vehicle electrical load, these values may be anywhere from 12.5 V to 15.5 V.

Electrical Power Management Description and Operation

Electrical Power Management

The electrical power management is used to monitor and control the charging system and alert the driver of possible problems within the charging system. The electrical power management system makes the most efficient use of the generator output, improves the battery state-of-charge, extends battery life, and manages system electrical loads.

The load shed operation is a means of reducing electrical loads during a low voltage or low battery state-of-charge condition.

The idle boost operation is a means of improving generator performance during a low voltage or low battery state-of-charge condition.

Each electrical power management function, either idle boost or load shed, is activated in incremental steps. For example, idle boost 1 must be active before idle boost 2 can be active. The criteria used by the body control module (BCM) to regulate electrical power management are outlined below:

Idle Boost and Load Shed With Current Sensor

Function	Battery Temperature Calculation	Battery Voltage Calculation	Amp-Hour Calculation	Action Taken
Idle Boost 1 Start	Less Than −15°C (5°F)	Less Than 13 V	—	First level Idle boost requested
Idle Boost 1 Start	—	—	Battery has a net loss greater than 0.6 Ah	First level Idle boost requested
Idle Boost 1 Start	—	Less Than 11 V	—	First level Idle boost requested
Idle Boost 1 End	Greater Than −10°C (14°F)	Greater Than 12 V	Battery has a net loss less than 0.2 Ah	First level Idle boost request cancelled
Idle Boost 2 Start	—	—	Battery has a net loss greater than 1.6 Ah	Second level Idle boost requested
Idle Boost 2 Start	—	Less Than 11 V	—	Second level Idle boost requested
Idle Boost 2 End	—	Greater Than 12 V	Battery has a net loss less than 0.8 Ah	Second level Idle boost request cancelled
Load Shed 1 Start	—	—	Battery has a net loss of 4 Ah	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 20% of their cycle
Load Shed 1 Start	—	Less Than 11 V	—	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 20% of their cycle
Load Shed 1 End	—	Greater Than 12 V	Battery has a net loss of less than 2 Ah	Clear Load Shed 1
Idle Boost 3 Start	—	—	Battery has a net loss of 10 Ah	Third level Idle boost requested
Idle Boost 3 Start	—	Less Than 11 V	—	Third level Idle boost requested
Idle Boost 3 End	—	Greater Than 12 V	Battery has a net loss of less than 6.0 Ah	Third level Idle boost request cancelled
Load Shed 2 Start	—	—	Battery has a net loss greater than 12 Ah	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 50% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 2 Start	—	Less Than 11 V	—	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 50% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 2 End	—	Greater Than 12 V	Battery has a net loss of less than 8 Ah	Clear Load Shed 2
Load Shed 3 Start	—	Less Than 11.9 V	Battery has a net loss greater than 20 Ah	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 100% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC

Function	Battery Temperature Calculation	Battery Voltage Calculation	Amp-Hour Calculation	Action Taken
Load Shed 3 Start	—	Less Than 11 V	—	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 100% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 3 End	—	Greater Than 12.6 V	Battery has a net loss of less than 13 Ah	Clear Load Shed 3

Idle Boost and Load Shed Without Current Sensor (based on battery voltage)

Function	Battery Temperature Calculation	Battery Voltage Calculation	Action Taken
Idle Boost 1 Start	Less Than −15°C (5°F)	Less Than 13 V	First level Idle boost requested
Idle Boost 1 Start	—	Less Than 12.6 V	First level Idle boost requested
Idle Boost 1 End	Greater Than −15°C (5°F)	—	First level Idle boost request cancelled
Idle Boost 1 End	—	Greater Than 13 V	First level Idle boost request cancelled
Idle Boost 2 Start	—	Less Than 12.4 V	Second level Idle boost requested
Idle Boost 2 End	—	Greater Than 12.5 V	Second level Idle boost request cancelled
Load Shed 1 Start	—	Less Than 12.3 V	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 20% of their cycle
Load Shed 1 End	—	Greater Than 12.4 V	Clear Load Shed 1
Idle Boost 3 Start	—	Less Than 10 V	Third level Idle boost requested
Idle Boost 3 End	—	Greater Than 12.3 V	Third level Idle boost request cancelled
Load Shed 2 Start	—	Less Than 12.1 V	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 50% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 2 End	—	Greater Than 12.2 V	Clear Load Shed 2
Load Shed 3 Start	—	Less Than 11.9 V	Rear Defrost, Heated Mirrors, Heated Seats, HVAC cycled OFF for 100% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 3 End	—	Greater Than 12.0 V	Clear Load Shed 3

Starting System Description and Operation

Starter Motor Operation (Without KL9)

The starter motors are non-repairable. They have pole pieces that are arranged around the armature. Both solenoid windings are energized. The pull-in winding circuit is completed to the ground through the starter motor. The windings work together magnetically to pull and hold in the plunger. The plunger moves the shift lever. This action causes the starter drive assembly to rotate on the armature shaft spline as it engages with the flywheel ring gear on the engine. Moving at the same time, the plunger also closes the solenoid switch contacts in the starter solenoid. Full battery voltage is applied directly to the starter motor and it cranks the engine.

As soon as the solenoid switch contacts close, current stops flowing thorough the pull-in winding because battery voltage is applied to both ends of the windings. The hold-in winding remains energized. Its magnetic field is strong enough to hold the plunger, shift lever, starter drive assembly, and solenoid switch contacts in place to continue cranking the engine. When the engine starts, pinion overrun protects the armature from excessive speed until the switch is opened.

When the crank signal is removed, the starter relay opens and battery voltage is removed from the starter solenoid S terminal. Current flows from the motor contacts through both windings to the ground at the end of the hold-in winding. However, the direction of the current flow through the pull-in winding is now opposite the direction of the current flow when the winding was first energized.

The magnetic fields of the pull-in and hold-in windings now oppose one another. This action of the windings, along with the help of the return spring, causes the starter drive assembly to disengage and the solenoid switch contacts to open simultaneously. As soon as the contacts open, the starter circuit is turned off.

Enhanced Starter Motor Operation (KL9)

The Engine Stop/Start system in GM vehicles automatically turns off the engine when the vehicle comes to a stop under certain driving conditions, and can quickly restart the engine in about 0.3 seconds when commanded to do so.

In order to smoothly restart the engine as quickly as possible while managing the greater number of engine starts, the Stop/Start system uses an enhanced starter motor that operates differently from a conventional starter motor. It has a high performance electric motor and a stronger pinion engagement mechanism than a conventional starter. It also has independent control of the pinion and motor.

The enhanced starter motor continues using the typical pinion engagement mechanism with a starter solenoid that drives the pinion gear to engage or disengage the flywheel of the engine. When engaged, the starter motor can rotate the engine flywheel and, in turn, the crankshaft.

On the enhanced starter of a Stop/Start system the operation is done in two separate functions inside the solenoid, Starter Motor and Pinion Actuator. Each function controlled individually by the ECM. There are two separate relays to control the two separate parts of the enhanced solenoid:

- KR27 Starter Motor Relay
- KR27C Starter Pinion Actuator Relay

The two individually-controlled relays allow for smooth engagement of the pinion gear into the flywheel with minimum noise and wear.

When the vehicle is coming to a stop, just before the engine stops rotating (at approximately 50 RPM) during stop/start operation, the ECM energizes the Starter Pinion Solenoid Actuator Relay to easily push the pinion gear into the flywheel gear without gear clash. (Fig. 8) When the engine stops rotating during Stop/Start operation (Auto Stop mode), the starter pinion gear is fully engaged, ready for the starter motor to become energized to quickly start the engine again.

A secondary need for the starter pinion to be driven into the flywheel gear before the engine stops rotating is to address quickly changing demands on the engine. For example, when a driver is slowing nearly to a stop — and the Stop/Start system is preparing for Auto Stop mode — but suddenly decides to release the brake and accelerate

In this situation, the engine has already stopped rotating, or nearly so. A conventional starter cannot restart the engine until the engine has completely stopped. However, with the enhanced starter, the starter pinion gear is fully engaged and ready to begin rotating the engine even before it fully stops turning. Otherwise, the engine would actually have to stop rotating before the pinion can engage smoothly to begin a restart.

To prevent a lag in engine operation, the ECM uses predictive speed matching of the flywheel gear speed and the pinion gear speed to engage the pinion gear into the flywheel gear without gear clash before the engine fully stops. By predicting how long it takes the starter motor to spin up using an algorithm, the pinion gear speed can be matched to the flywheel gear speed. The result is an almost instant restart that is possible at extremely low engine speeds.

Ignition Switch

Keyless Start

When the Ignition mode switch is placed in the crank position, a discrete signal is supplied to the body control module (BCM) notifying it that the ignition is in the crank position. The BCM then sends a serial data message to the engine control module (ECM) that crank has been requested. The ECM then verifies that the brake pedal is applied and for manual transmission the clutch is fully depressed or for automatic transmission is in Park/Neutral. If it is, the ECM then supplies 12 V to the control circuit of the starter relay. When this occurs, battery positive voltage is supplied through the switch side of the crank relay to the S terminal of the starter solenoid.

Key Start

When the ignition switch is placed in the Start position, a discrete signal is supplied to the body control module (BCM) notifying it that the ignition is in the Start position. The BCM then sends a message to the engine control module (ECM) notifying it that CRANK has been requested. The ECM verifies that the transmission is in Park or Neutral. If it is, the ECM then supplies 12 V to the control circuit of the crank relay. When this occurs, battery positive voltage is supplied through the switch side of the crank relay to the S terminal of the starter solenoid.

Section 7

HVAC

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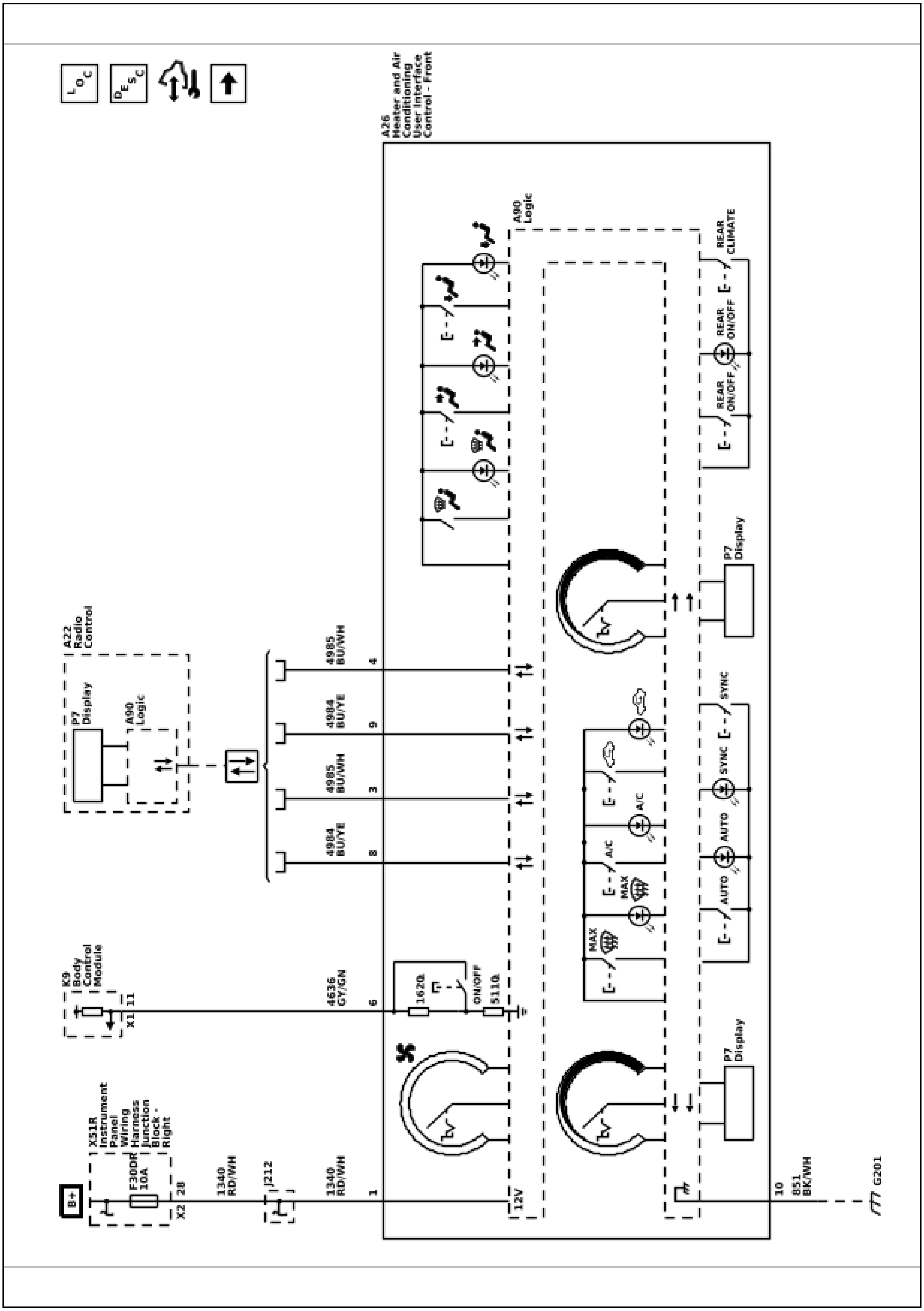
HVAC

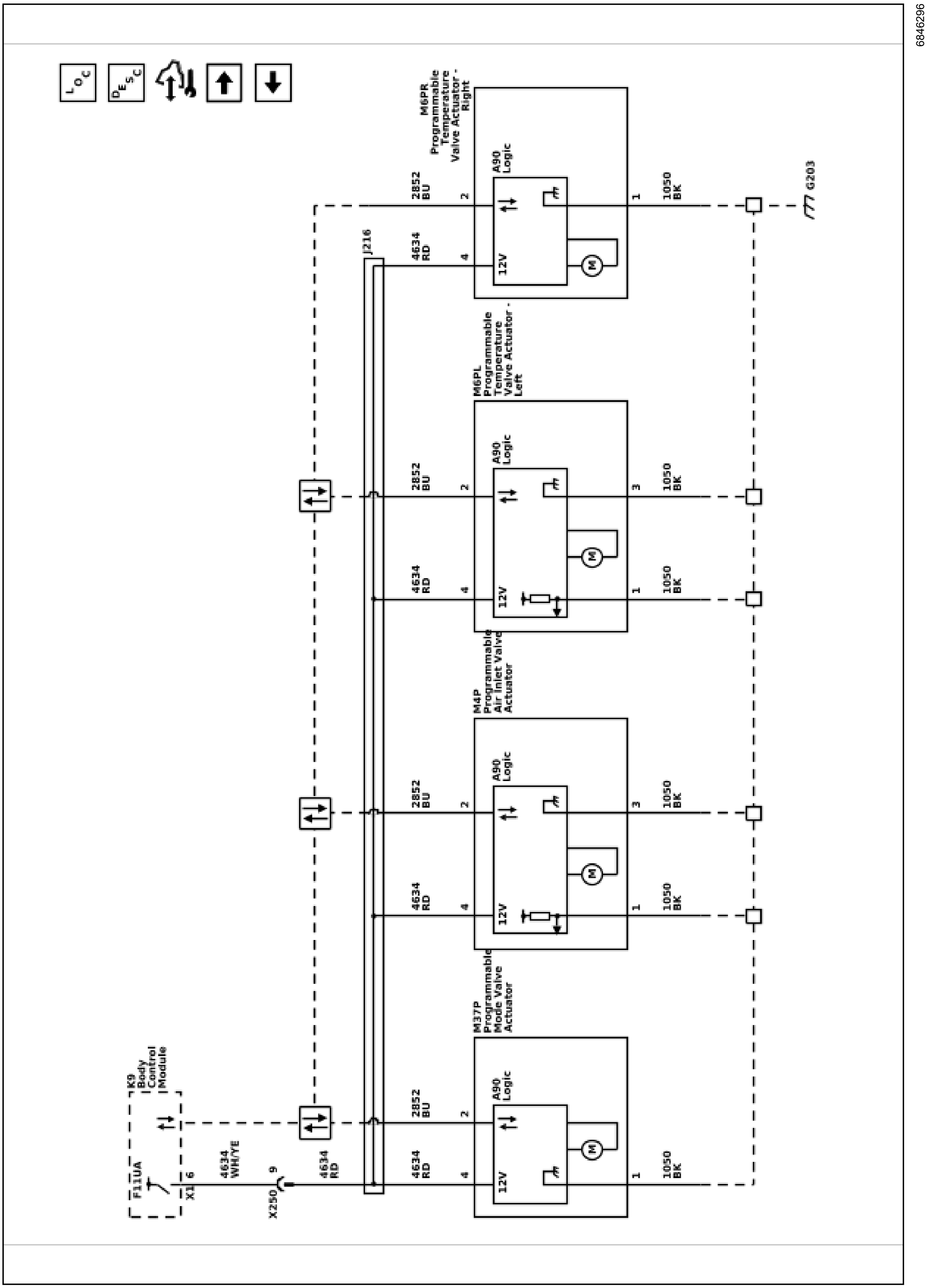
HVAC - Automatic

Schematic and Routing Diagrams

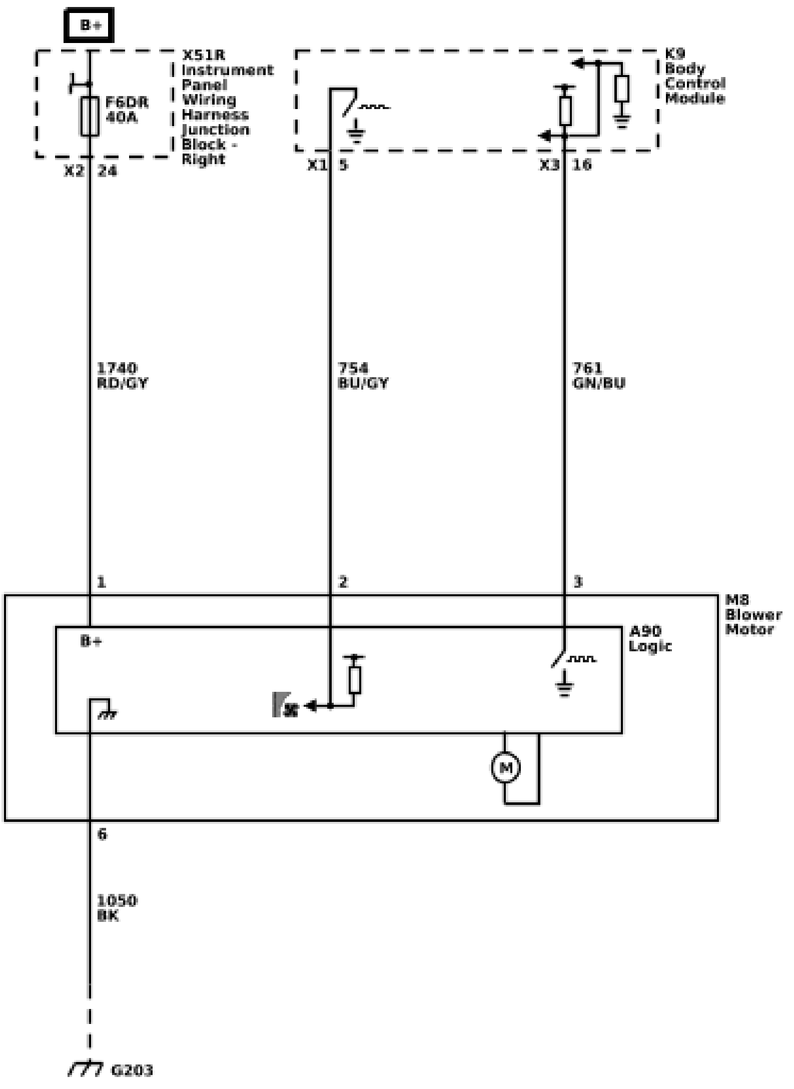
HVAC Schematics (HVAC Controls)


6846295
A26 Heater and Air Conditioning User Interface Control - Front
A90 Logic
REAR CLIMATE
REAR ON/OFF
REAR ON/OFF
P7 Display
SYNC
SYNC
AUTO
AUTO
A/C
A/C
MAX
MAX
P7 Display
A22 Radio Control
P7 Display
A90 Logic
4985 BU/WH
4
4984 BU/YE
9
4985 BU/WH
3
4984 BU/YE
8
K9 Body Control Module
X1 11
4636 GY/GN
6
162Ω
ON/OFF
511Ω
X51R Instrument Panel Wiring Harness Junction Block - Right
F30DR 10A
X2 28
B+
1340 RD/WH
J212
1340 RD/WH
1
12V
10
851 BK/WH
G201

HVAC Schematics (Actuators)

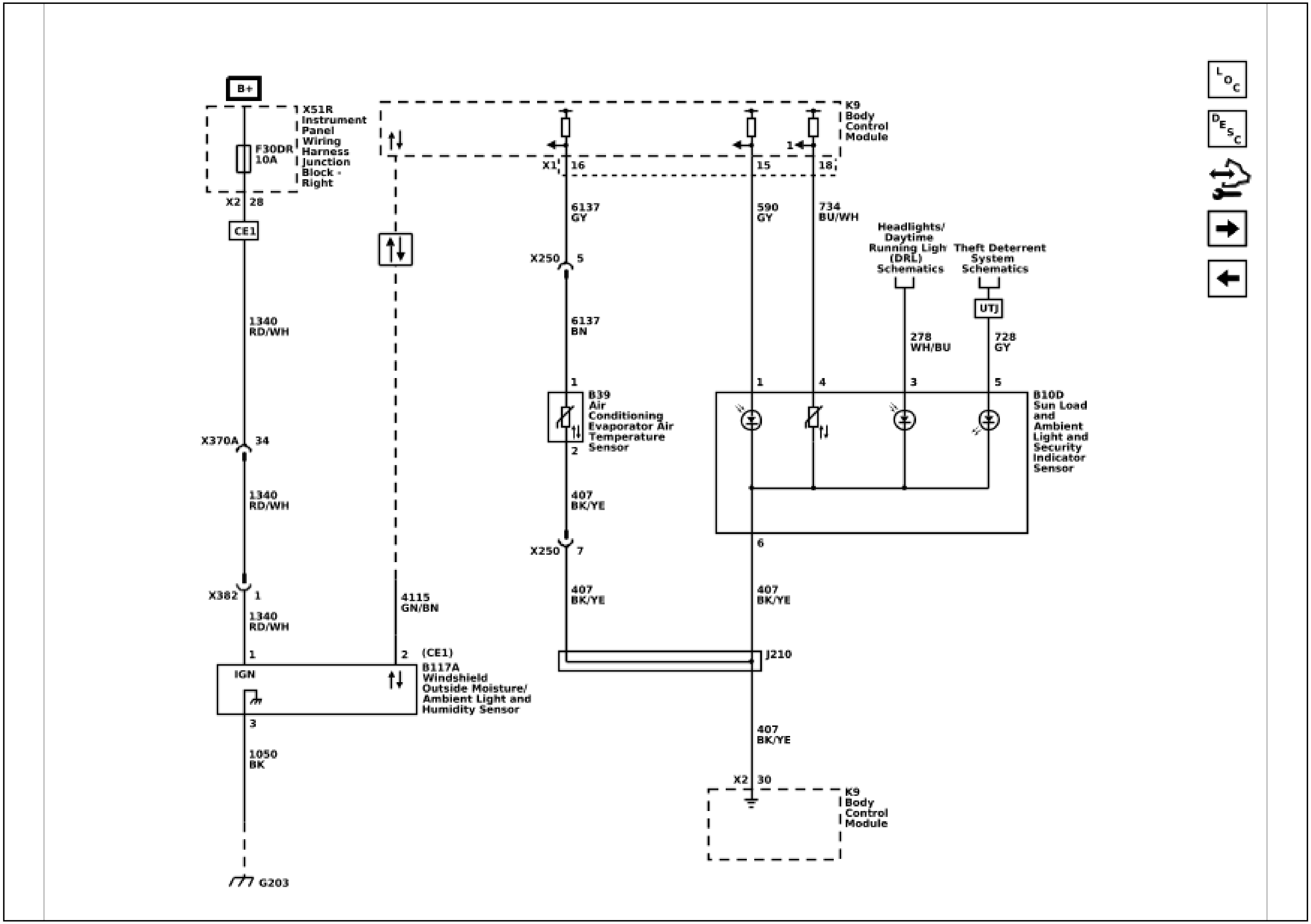

6846296
K9 Body Control Module
F11UA
X1 6
4634 WH/YE
X250 9
4634 RD
J216
M37P Programmable Mode Valve Actuator
M4P Programmable Air Inlet Valve Actuator
M6PL Programmable Temperature Valve Actuator - Left
M6PR Programmable Temperature Valve Actuator - Right
A90 Logic
12V
M
2852 BU
4634 RD
1050 BK
2
4
1
3
G203

HVAC Schematics (Blower Motor)


B+
X51R
Instrument
Panel
Wiring
Harness
Junction
Block -
Right
F6DR
40A
X2 24
K9
Body
Control
Module
X1 5
X3 16
1740
RD/GY
754
BU/GY
761
GN/BU
1
2
3
M8
Blower
Motor
A90
Logic
B+
M
6
1050
BK
G203

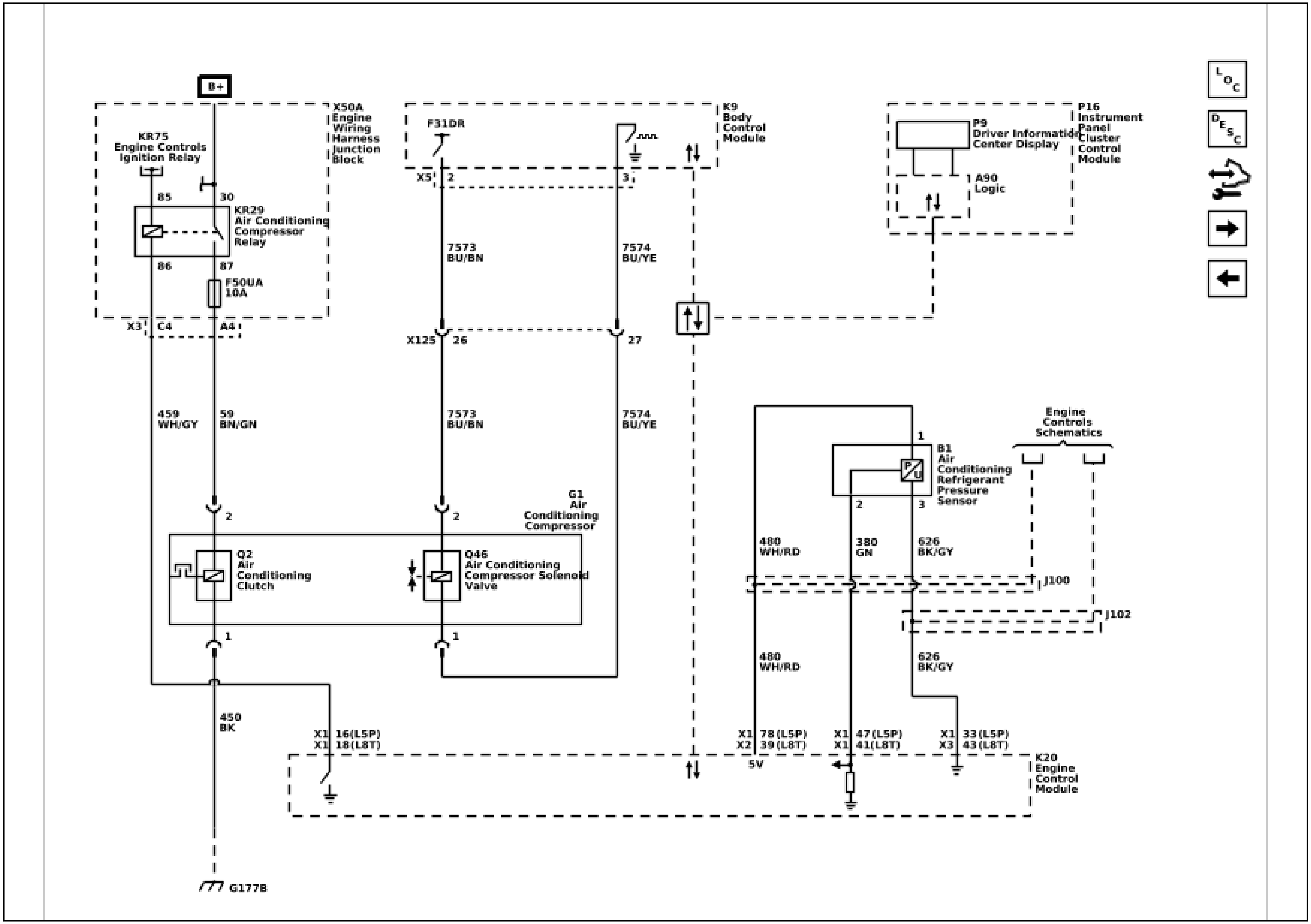
6846297

HVAC Schematics (Windshield Sensors and A/C Evaporator Temperature Sensor)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F30DR 10A
X2 28
CE1
1340 RD/WH
X370A 34
1340 RD/WH
X382 1
1340 RD/WH
1
IGN
3
1050 BK
G203
K9 Body Control Module
X1 16
15
18
1
6137 GY
X250 5
6137 BN
1
B39 Air Conditioning Evaporator Air Temperature Sensor
2
407 BK/YE
X250 7
407 BK/YE
4115 GN/BN
2 (CE1)
B117A Windshield Outside Moisture/ Ambient Light and Humidity Sensor
590 GY
734 BU/WH
Headlights/ Daytime Running Ligh (DRL) Schematics
Theft Deterrent System Schematics
UTJ
278 WH/BU
728 GY
1
4
3
5
B10D Sun Load and Ambient Light and Security Indicator Sensor
6
407 BK/YE
J210
407 BK/YE
X2 30
K9 Body Control Module
LOC
DESC

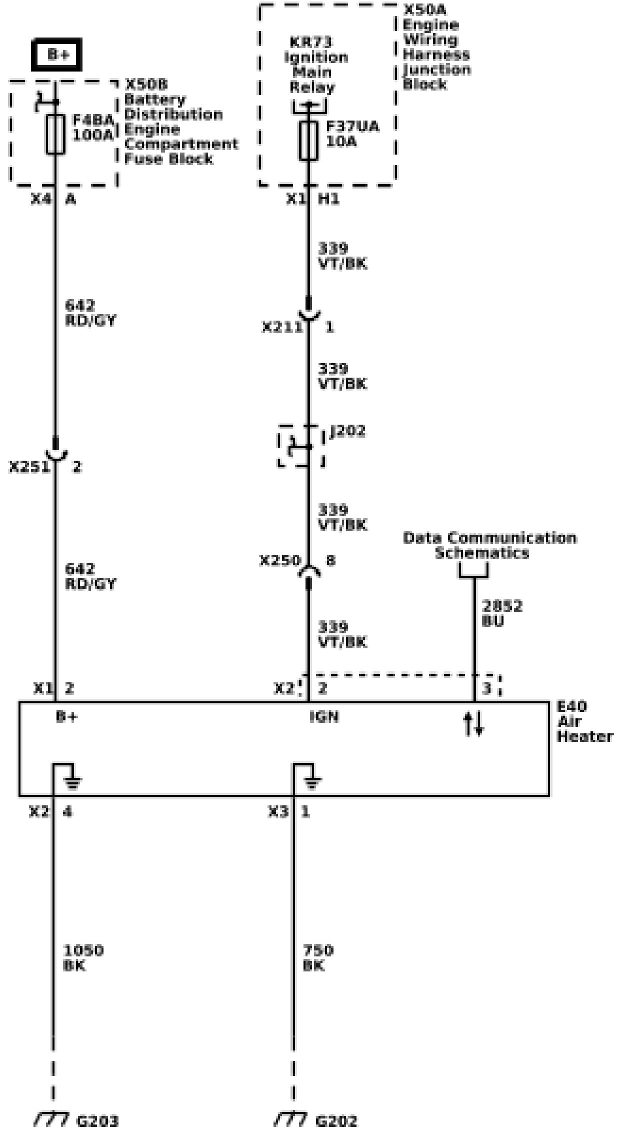
6846298

HVAC Schematics (A/C Compressor Controls)


B+
X50A Engine Wiring Harness Junction Block
KR75 Engine Controls Ignition Relay
85
30
KR29 Air Conditioning Compressor Relay
86
87
F50UA 10A
X3
C4
A4
459 WH/GY
59 BN/GN
F31DR
K9 Body Control Module
X5
2
3
7573 BU/BN
7574 BU/YE
X125
26
27
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
G1 Air Conditioning Compressor
Q2 Air Conditioning Clutch
Q46 Air Conditioning Compressor Solenoid Valve
2
1
450 BK
G177B
B1 Air Conditioning Refrigerant Pressure Sensor
Engine Controls Schematics
J100
J102
480 WH/RD
380 GN
626 BK/GY
X1 16(L5P)
X1 18(L8T)
X1 78(L5P)
X2 39(L8T)
5V
X1 47(L5P)
X1 41(L8T)
X1 33(L5P)
X3 43(L8T)
K20 Engine Control Module

6846299

HVAC Schematics (Air Heater)


B+
X50B
Battery
Distribution
Engine
Compartment
Fuse Block
F4BA
100A
X4 A
642
RD/GY
X251 2
642
RD/GY
X1 2
X50A
Engine
Wiring
Harness
Junction
Block
KR73
Ignition
Main
Relay
F37UA
10A
X1 H1
339
VT/BK
X211 1
339
VT/BK
J202
339
VT/BK
X250 8
339
VT/BK
X2 2
Data Communication
Schematics
2852
BU
3
B+
IGN
E40
Air
Heater
X2 4
X3 1
1050
BK
750
BK
G203
G202

6846300

Description and Operation

Automatic HVAC Description and Operation

The air temperature and the air delivery description and operation are divided into the following:

- HVAC Control Components
- Air Speed and Blower Motor
- Air Delivery
- Recirculation Operation
- Heating and A/C Operation
- Automatic Operation
- Engine Coolant and A/C System Refrigerant

HVAC Control Components

K9 Body Control Module

The body control module (BCM) is a CAN device that interfaces between the operator and the HVAC system to maintain and control desired air temperature and air distribution settings. The BCM provides a device ON-Signal for the HVAC controls. The BCM provides blower, air delivery mode and air temperature control.

A26 Heater and Air Conditioning User Interface Control - Front

The HVAC control contains all switches which are required to control the functions of HVAC and serve as interface between the operator and the BCM. The selected values are passed to the BCM via serial data.

Actuators

Doors in the HVAC case assembly are used to control air flow. The BCM operates the doors through the use of actuators, with one actuator being used for each door. The system has the following air control doors and associated actuators: mode, left and right temperature, and recirculation.

Each actuator used in the system is a LIN device controlled by the BCM. The BCM supplies a 12 V reference voltage to the actuators, and ground is provided by the wiring harness. When the BCM sends a request message to the actuator, the actuator then operates internal stepper motors to move the door to the required position.

Duct Air Temperature

Physical duct air temperature sensors are not used with the system. The air temperature in the air distribution ducts is calculated by the BCM based on the engine coolant temperature, coolant flow, evaporator temperature, outside air temperature, solar load, blower motor speed, air inlet door position, and temperature door position information. The BCM uses the values to calculate actuator position.

B39 Air Conditioning Evaporator Air Temperature Sensor

The evaporator temperature sensor is a 2-wire negative temperature coefficient thermistor. The sensor operates within a temperature range of −40 to +85°C (−40 to +185°F). The sensor is installed near the evaporator core to measure the air temperature exiting the core.

Based on vehicle operating conditions and operator settings, the HVAC software algorithms will determine a target evaporator air temperature. The operation of the compressor solenoid will be adjusted as needed to quickly reach and maintain the targeted temperature.

B1 Air Conditioning Refrigerant Pressure Sensor

The A/C refrigerant pressure sensor is a 3-wire piezo-electric pressure transducer. A 5 V reference voltage, low reference, and signal circuits enable the sensor to operate. The A/C pressure signal can be between 0.2–4.8 V. When the A/C refrigerant pressure is low, the signal value is near 0 V. When the A/C refrigerant pressure is high, the signal value is near 5 V. The engine control module (ECM) converts the voltage signal to a pressure value. When pressure is too high or too low, the ECM will not allow the A/C compressor clutch to engage.

G1 Air Conditioning Compressor

The A/C compressor uses a conventional belt driven magnetic clutch to engage and mechanically turn the compressor. When the A/C switch is pressed, the BCM sends an A/C request message to the ECM via serial data. If specific criteria is met, the ECM then grounds the A/C compressor clutch relay control circuit, which will switch the A/C compressor clutch relay. With the relay contacts closed, battery voltage is supplied to the permanently grounded A/C compressor clutch. The A/C compressor clutch will then be activated.

This A/C system utilizes a variable displacement solenoid valve to alter the amount of displacement created by the turning of the compressor. The BCM provides both battery voltage and a pulse width modulated ground to the Q46 Air Conditioning Compressor Solenoid Valve. When the A/C switch is pressed, the BCM grounds the variable displacement solenoid using a (PWM) signal in order to determine the amount of compressor displacement. The performance of the A/C compressor is regulated based on cooling load.

B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor (CE1)

The windshield outside moisture, ambient light, and humidity sensor is used by the wiper system to determine exterior moisture, and by the HVAC system for inside windshield temperature and humidity.

The sensors are part of a LIN windshield sensor array, and the sensor values are transmitted to the BCM via serial data.

When equipped, this sensor assembly provides information to the HVAC system about:

- Relative humidity level at windshield (passenger compartment side)
- Temperature of the windshield (passenger compartment side)
- Temperature of the humidity sensor element

The relative humidity sensor measures the relative humidity of the passenger compartment side of the windshield. It also detects the temperature of the windshield surface on the passenger compartment side. Both values are used as control inputs for the BCM application to calculate the fog risk on windshield compartment side and ability to reduce fuel consumption by decreasing A/C compressor power to a minimum without causing any fog. The sensor will also enable partial recirculation mode in order to improve heat-up performance of the passenger compartment under cold ambient temperature conditions without the risk of mist build-up on the windshield. The humidity sensor element temperature sensor supplies the temperature of the humidity sensor element. It is only needed if the thermal contact between the humidity sensing element and the inside windshield surface is not sufficient.

B10D Sun Load and Ambient Light and Security Indicator Sensor

The ambient light/sunload sensor includes the solar sensor and passenger compartment temperature sensor.

The solar sensor is connected to a low reference and 5 V supply through the BCM. As the sunload increases, the sensor signal voltage also increases and vice versa. The signal provided to the BCM varies between 1.2–4.85 V.

The passenger compartment temperature sensor is a negative temperature coefficient thermistor, connected to a low reference and 5 V supply through the BCM. As the air temperature increases, the sensor resistance decreases. The signal varies between 0–5 V.

Bright or high intensity light can cause the vehicles interior temperature to increase. The HVAC system uses the sensor values and compensates for the increased temperature to maintain the system settings.

E40 Air Heater (C32)

Some models are equipped with an auxiliary electric heater to assist in warming the passenger compartment when the engine coolant has not sufficiently warmed to operating temperature. The air heater is a LIN device. The heater uses an ignition circuit, battery voltage circuit, ground circuit, and a serial data signal from the BCM to operate.

The heater is a 12 V positive temperature coefficient heating element located in the HVAC case just downstream of the traditional heater core. The system will activate the heater when the outside temperature is less than approximately 8°C (46°F), the engine coolant temperature is less than approximately 75°C (167°F), and the temperature blend door is commanded to the full hot position.

Air Speed and M8 Blower Motor

The selected blower motor speed is passed from the controls to the BCM via serial data.

The motor uses a fused B+, ground, control, and speed output signal circuits to operate. The blower motor speed is controlled by increasing or decreasing the voltage drop on the ground side of the blower motor speed control circuit. The BCM provides a low side pulse width modulation (PWM) signal to the blower motor to request a specific motor speed. The blower motor internal circuitry translates the PWM signal and drives the motor accordingly.

The blower motor has a signal wire used to output a speed signal. The signal is monitored by the BCM. The BCM monitors the blower motor speed to modify the total commanded engine coolant flow rate, which is a percentage of available coolant flow sent to the heater core for occupant comfort and windshield defrosting. The HVAC Blower Speed is monitored so that the ECM can optimize engine coolant flow for fuel economy and emissions.

Afterblow

Afterblow is a feature that dries the evaporator core by operating the blower motor after the engine is turned OFF under certain conditions. This reduces the amount of moisture that can create undesirable odors. For additional information on afterblow, the default setting, and changing the setting, refer to [Link target (target-id 328146-) not found] .

Air Delivery

The BCM controls the distribution of air by the use of recirculation and mode door actuators. The modes that may be selected are:

- Defrost: windshield outlet
- Panel: dashboard outlets
- Floor: front footwell outlets
- Defog: defrost + floor
- Bi-level: panel + floor
- Tri-level: panel + defrost + floor
- Hi-level: panel + defrost

The desired air distribution mode can be selected with the air distribution switches at the HVAC control. The HVAC control delivers the values to the BCM via serial data. The BCM sends a request to the mode door actuator to move the door to the required position. Depending on the position of the door, air is distributed through various ducts leading to the outlets in the dash. When defrost airflow is active, the BCM will move the recirculation actuator to outside air, to aid in reducing window fogging. When defrost is selected the blower motor will be activated, regardless of the coolant temperature. A/C is available in all modes.

Refer to the owners manual for operation of the HVAC controls and mode selection.

Recirculation Operation

The recirculation switch is integrated into the HVAC control. The selected recirculation setting is sent to the BCM via serial data. The BCM controls the air intake using the recirculation actuator. In recirculation mode the recirculation door is positioned to block outside air from entering and circulate the air within the vehicle. In outside air mode the recirculation door is positioned to route outside air into the vehicle.

Recirculation is only available if the defrost mode is not active. When the defrost mode is active, the recirculation actuator positions the recirculation door so that outside air is circulated to the windshield to reduce fogging.

In automatic mode the values of the sensors are used as inputs for the BCM to calculate the fog risk on the passenger compartment side of the windshield. The A/C compressor and the defrost mode may be activated to prevent or remove fog on the passenger compartment side of the windshield.

In automatic mode, a partial recirculation mode may be commanded to accelerate cabin heating or cooling and reduce energy usage. The recirculation indicator remains illuminated at all times, regardless of the actual operating mode determined by the system.

Heating and A/C Operation

The purpose of the heating and A/C system is to provide heated and cooled air to the interior of the vehicle. The A/C system will also remove humidity from the interior and reduce windshield fogging. Regardless of the temperature setting, the following may affect the rate that the HVAC system can achieve the desired temperature:

- Recirculation setting
- Difference between inside and desired temperature
- Blower motor speed setting
- Mode setting
- Dashboard outlet open/closed position

When the A/C switch or the AUTO switch is pressed, the HVAC control sends a signal to the BCM via serial data. The BCM evaluates this signal and sends an A/C request signal to the ECM via CAN-Bus. The ECM checks all preconditions before releasing and if all conditions are met sends a release signal back to the BCM. The A/C compressor is activated by the BCM. The BCM supplies battery voltage to the A/C compressor solenoid. When the A/C switch is pressed, the BCM provides a pulse width modulation (PWM) signal to the A/C compressor solenoid in order to command the performance of the A/C compressor. The performance of the A/C compressor is regulated using evaporator temperature and engine load.

The A/C indicator does not indicate the compressor is currently active. The A/C indicator shows that A/C has been requested and the system will activate the compressor as needed.

The following conditions must be met in order to activate the A/C compressor:

- Battery voltage is between 9–18 V
- Engine coolant temperature is less than 124°C (255°F)
- Engine speed is greater than 600 RPM
- Engine speed is less than 5 500 RPM
- A/C high side pressure is between 269–2 929 kPa (39–425 PSI)
- Throttle position is less than 100%
- Evaporator temperature is greater than 3°C (38°F)
- ECM does not detect immoderate torque load
- ECM does not detect insufficient idle quality
- The ambient temperature is above 1°C (34°F)

The sensor information is used by the ECM to determine the following:

- The A/C high side pressure
- An A/C system load on the engine
- An immoderate A/C high side pressure
- The heat load at the A/C condenser

The air streams into the passenger compartment through the heater core and the evaporator core. The air temperature actuator drives the mixed air door to direct the airflow. If the interior temperature should be increased, the mixed air door is put into the position in which more air streams through the heater core. If the interior temperature should be decreased, the mixed air door is put into the position in which more air streams through the evaporator core.

Automatic Operation

In automatic operation, the BCM maintains the comfort level inside of the vehicle by controlling the A/C compressor solenoid, the blower motor, the air temperature actuators, mode actuator and recirculation actuator.

The automatic mode indicator shows that the system is in full automatic operation. If an individual setting is changed (excluding temperature), the automatic indicator will turn off, and that function will enter manual control. All other functions will remain under automatic control unless manually changed.

To put the HVAC system in automatic mode, the following is required:

1. The auto switch must be activated.
2. The air temperature switch must not be in either the full hot or full cold position.

Once the desired temperature is reached, the blower motor, mode, recirculation and temperature actuators automatically adjust to maintain the temperature selected. The BCM performs the following functions to maintain the desired air temperature:

- Monitors the following:
  - Ambient (outside) air temperature sensor
  - Passenger compartment temperature sensor
  - Calculated front duct air temperatures
  - Windshield temperature and inside moisture sensor (ASV/ CE1)
  - Evaporator temperature sensor
  - Ambient light/sunload sensor
- Regulate the blower motor speed
- Position the air temperature actuators
- Position the mode door actuators
- Position the recirculation actuator
- Control of the A/C compressor solenoid

When the temperature setting is set to full hot, the blower speed will increase gradually as the coolant warms to normal operating temperature. When normal engine operating temperature is reached the blower stays on high speed and the air temperature actuators stays in the full heat position.

When the temperature setting is set to full cold, the blower will immediately operate at high speed and the air temperature actuators move to full cold position. The mode actuator moves to the panel position and the recirculation actuator moves to the recirculation position.

Under cold ambient temperatures, the automatic HVAC system provides heat in the most efficient manner. The operator can select an extreme temperature setting but the system will not warm the vehicle any faster. Under warm ambient temperatures, the automatic HVAC system also provides air conditioning in the most efficient manner. Selecting an extreme cool temperature will not cool the vehicle any faster.

In automatic mode the values of the windshield temperature and inside moisture sensor are used as control inputs for the BCM application to calculate the fog risk on the passenger compartment side of the windshield and ability to reduce fuel consumption by decreasing A/C compressor power to a minimum without causing any fog. The A/C compressor and the defrost mode are activated to prevent or remove fog on the passenger compartment side of the windshield. The sensor will also enable partial recirculation mode in order to improve heat-up performance of the passenger compartment under cold ambient temperature conditions without the risk of mist build-up on the windshield.

Engine Coolant and A/C System Refrigerant

For information on engine coolant, coolant flow, A/C refrigerant, and the A/C refrigerant cycle, refer to [Link target (target-id 162334-) not found] .

Section 8

Power and Signal Distribution

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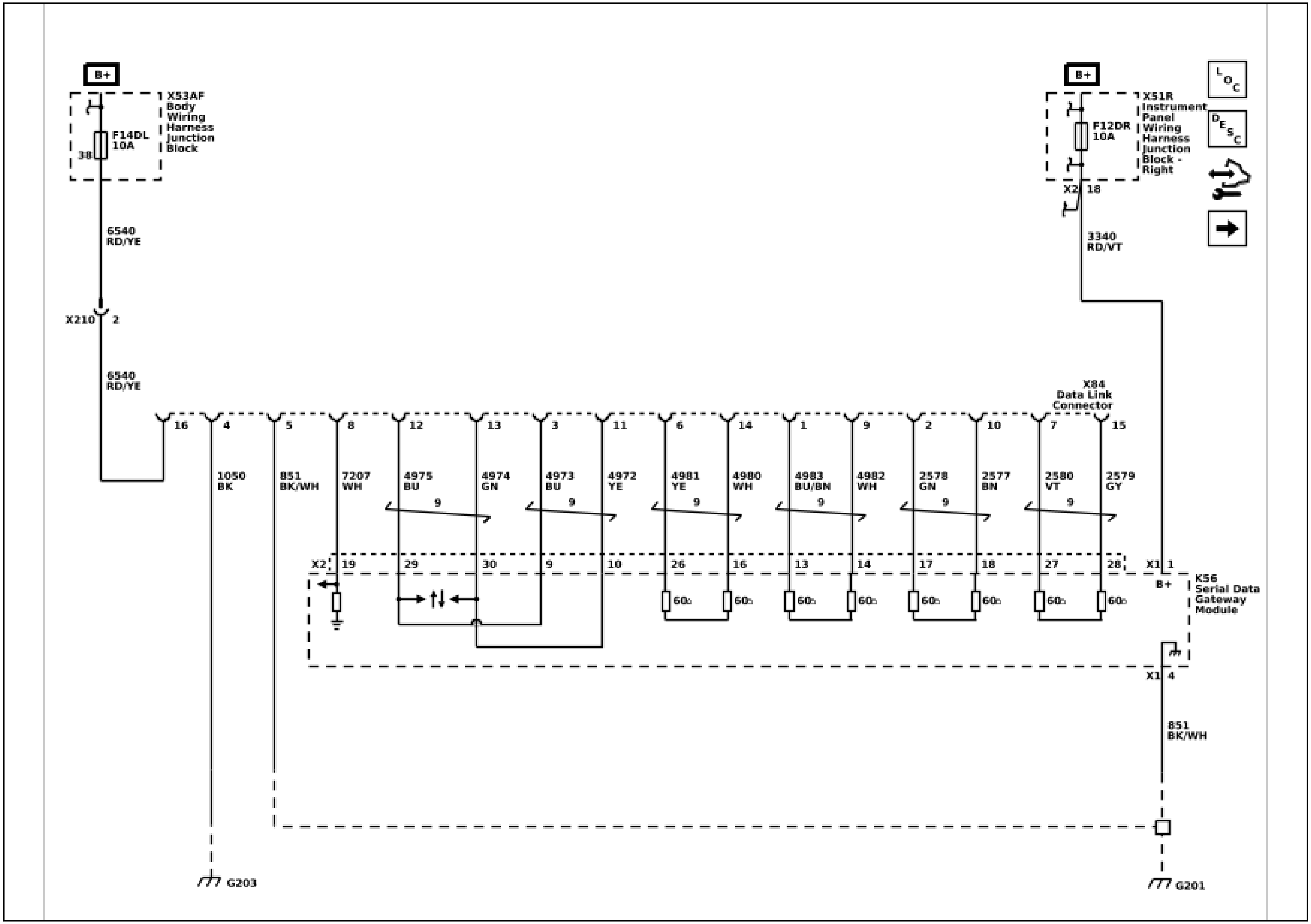
Power and Signal Distribution

Data Communications

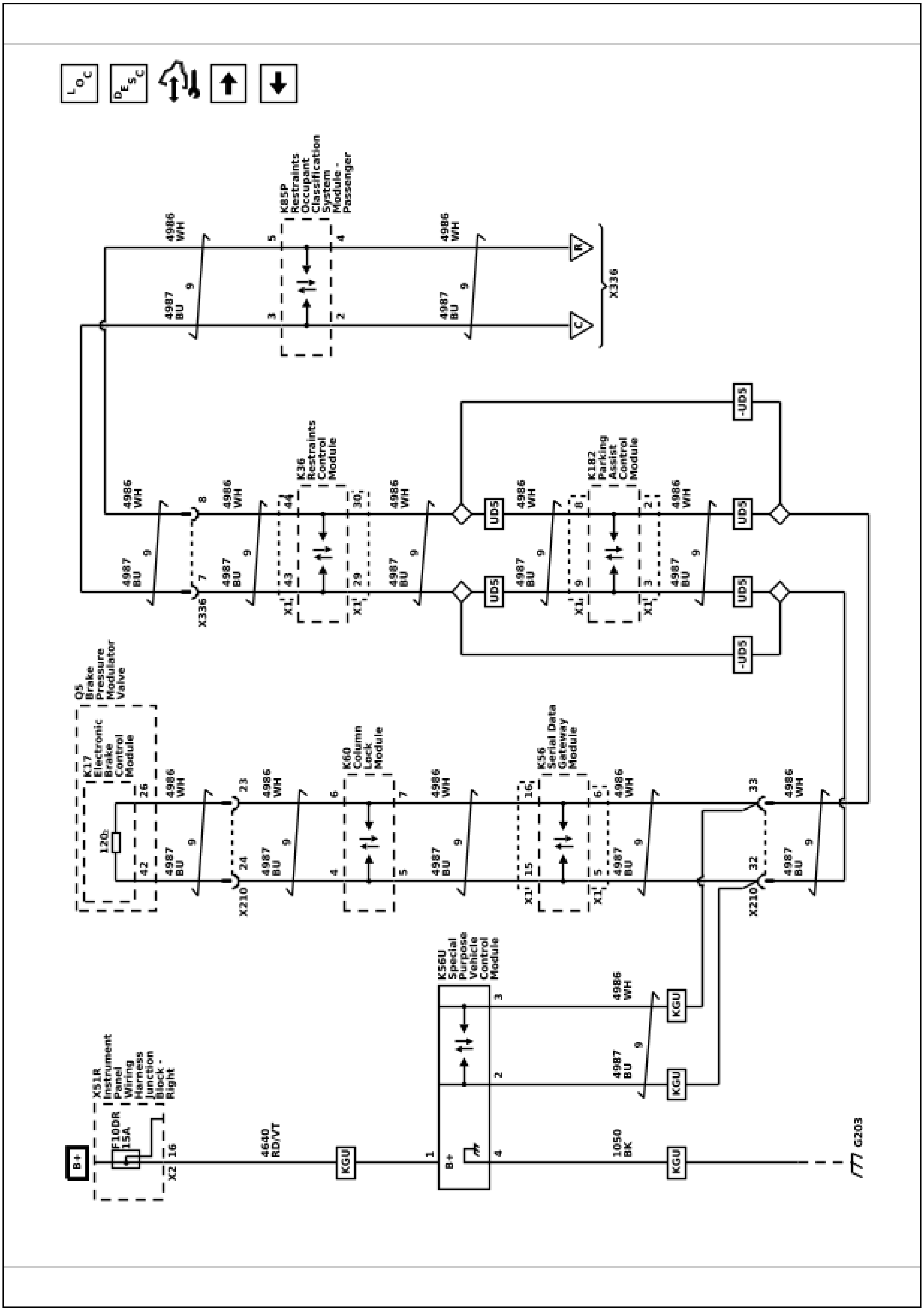
Schematic and Routing Diagrams

Data Communication Schematics (Data Link Connector and Serial Data Gateway Module Power and Ground)

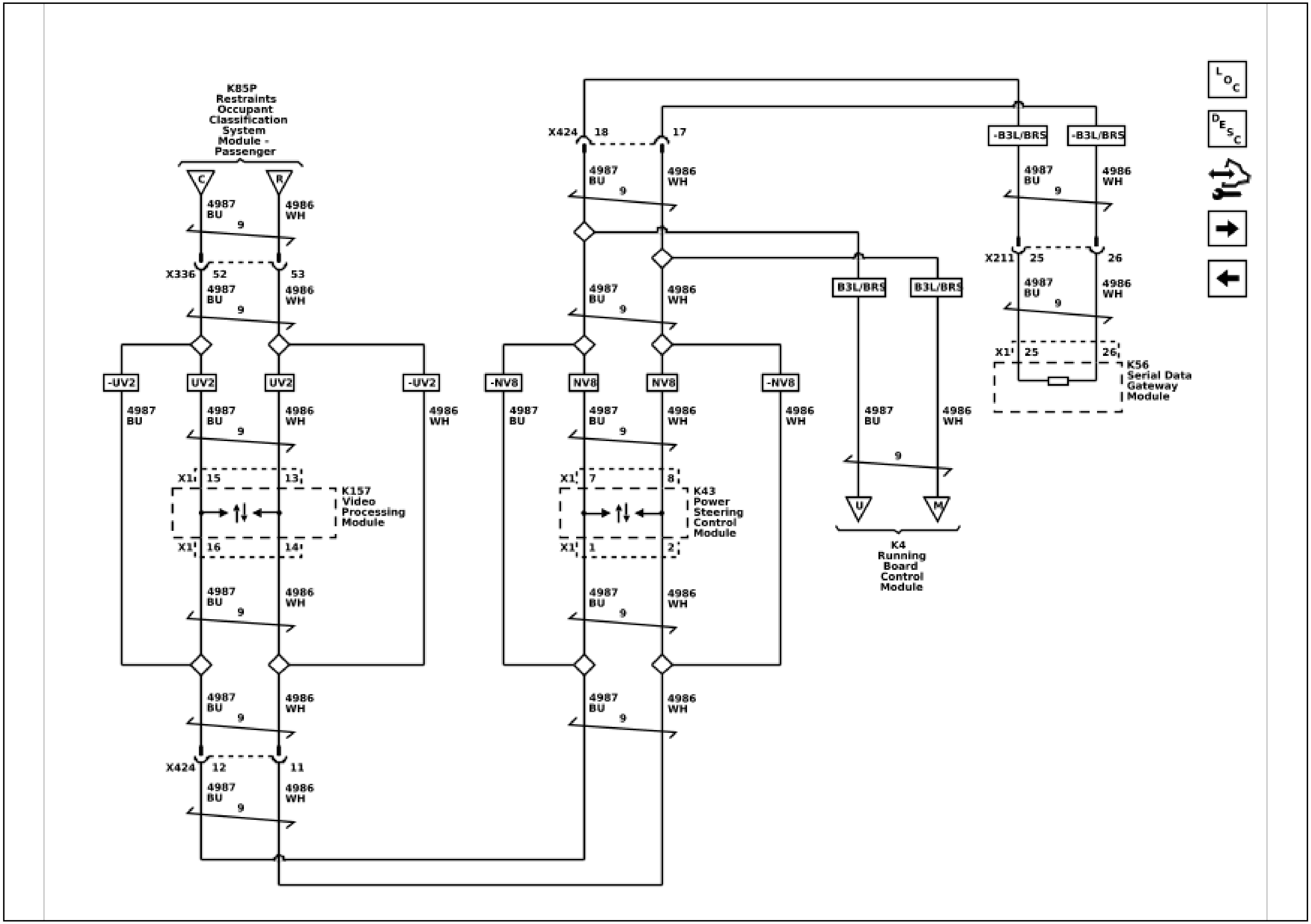

B+
X53AF Body Wiring Harness Junction Block
F14DL 10A
38
6540 RD/YE
X210 2
6540 RD/YE
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F12DR 10A
X2 18
3340 RD/VT
LOC
DESC
X84 Data Link Connector
16
4
5
8
12
13
3
11
6
14
1
9
2
10
7
15
1050 BK
851 BK/WH
7207 WH
4975 BU
4974 GN
4973 BU
4972 YE
4981 YE
4980 WH
4983 BU/BN
4982 WH
2578 GN
2577 BN
2580 VT
2579 GY
9
X2 19
29
30
9
10
26
16
13
14
17
18
27
28
X1 1
B+
60Ω
K56 Serial Data Gateway Module
X1 4
851 BK/WH
G203
G201

6846301

Data Communication Schematics (CAN 1 - 1 of 3 and Special Purpose Vehicle Control Module Power and Ground)

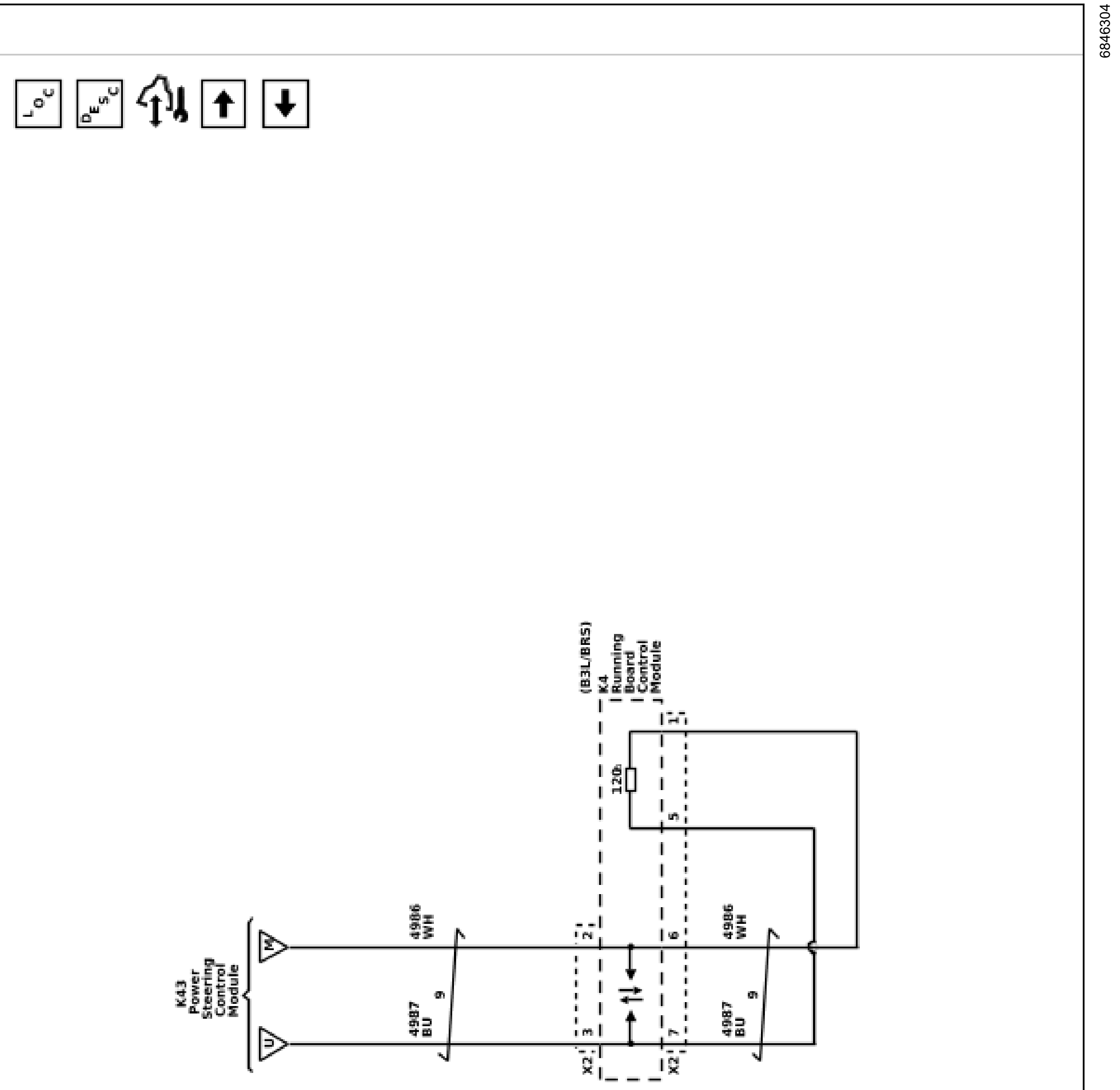

6846302
LOC
DESC
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F10DR 15A
X2 16
4640 RD/VT
KGU
K56U Special Purpose Vehicle Control Module
1 B+
4
1050 BK
G203
2
3
4987 BU 9
4986 WH
Q5 Brake Pressure Modulator Valve
K17 Electronic Brake Control Module
120Ω
42
26
X210 24
23
K60 Column Lock Module
4
5
6
7
K56 Serial Data Gateway Module
X1 15
16
X1 5
6
X210 32
33
-UD5
UD5
X336 7
8
K36 Restraints Control Module
X1 43
44
X1 29
30
K182 Parking Assist Control Module
X1 9
8
X1 3
2
K85P Restraints Occupant Classification System Module - Passenger
3
5
2
4
C
R
X336

Data Communication Schematics (CAN 1 - 2 of 3)

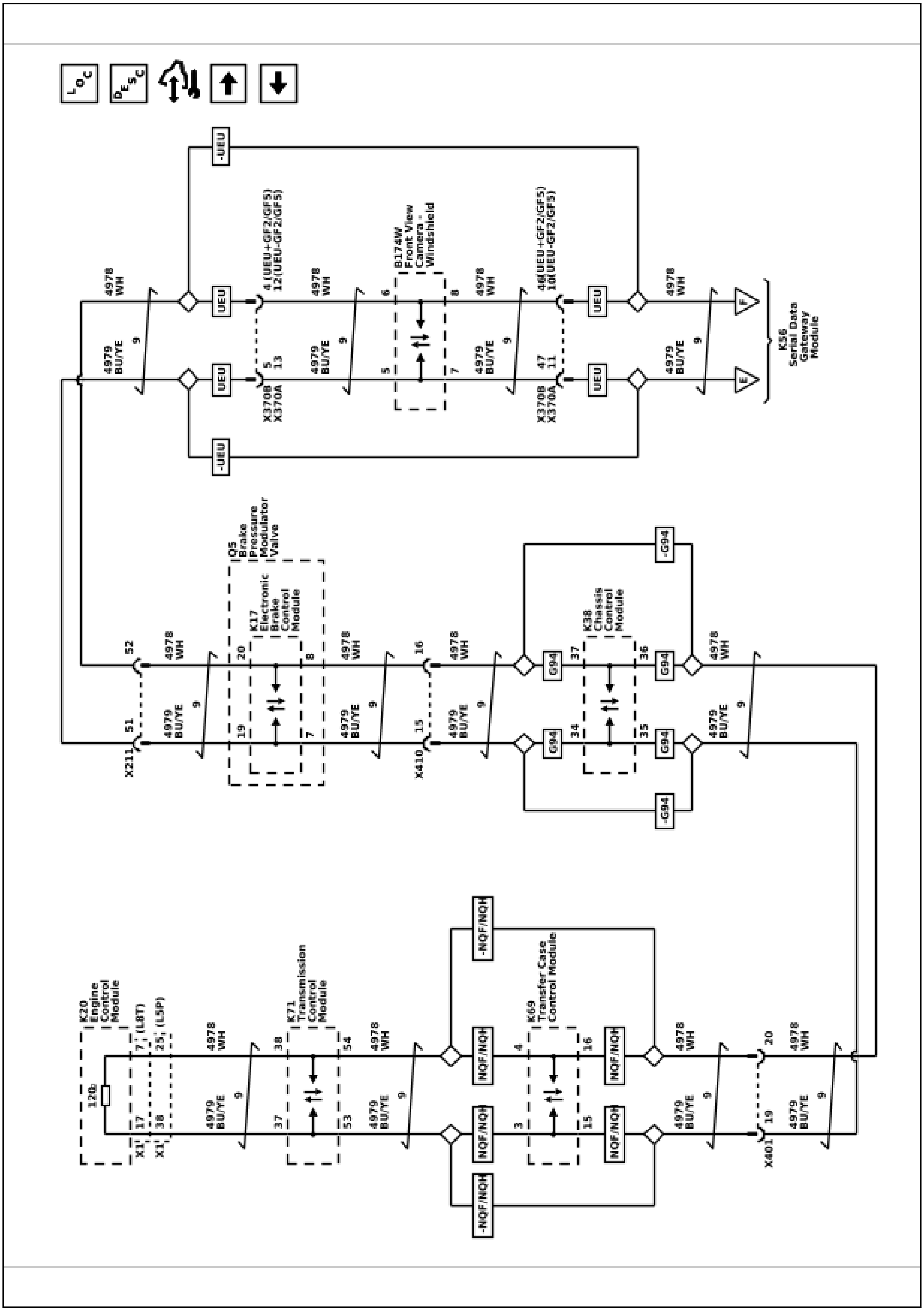

K85P Restraints Occupant Classification System Module - Passenger
C
R
4987 BU
4986 WH
9
X336
52
53
UV2
-UV2
X1
15
13
16
14
K157 Video Processing Module
X424
12
11
18
17
NV8
-NV8
7
8
1
2
K43 Power Steering Control Module
B3L/BRS
-B3L/BRS
U
M
K4 Running Board Control Module
X211
25
26
K56 Serial Data Gateway Module

6846303

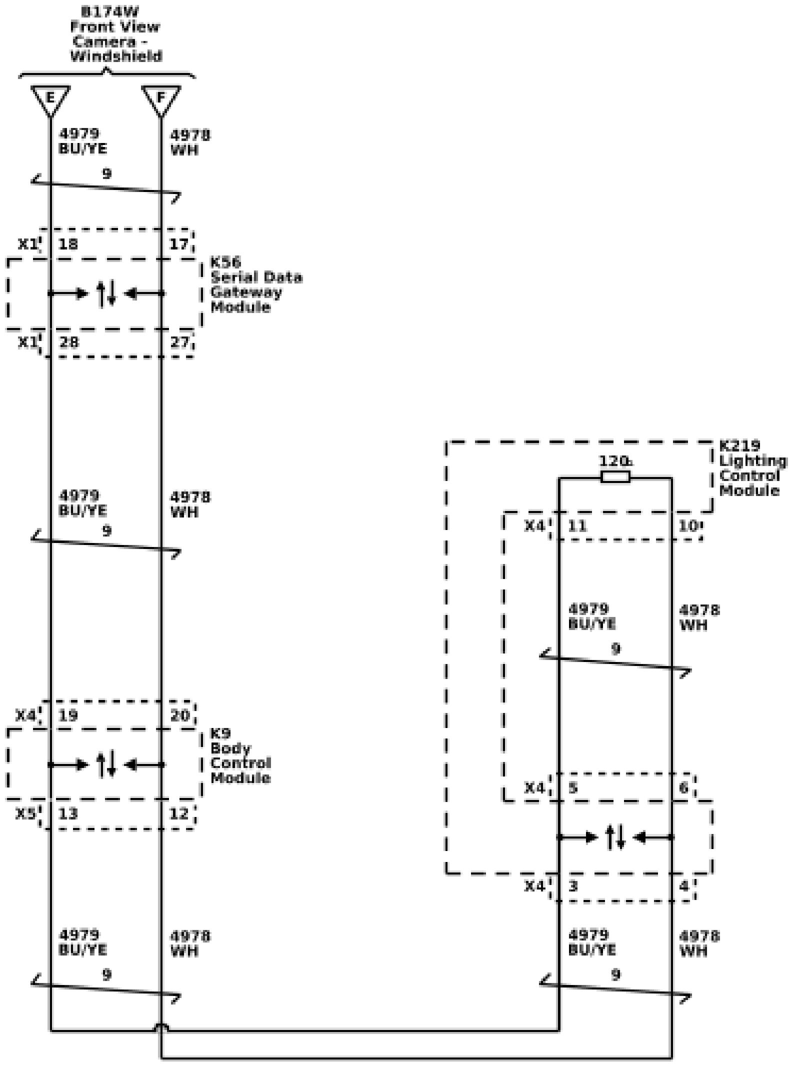
Data Communication Schematics (CAN 1 - 3 of 3)


6846304
K43
Power
Steering
Control
Module
4986
WH
4987
BU
9
X2
2
3
(B3L/BRS)
K4
Running
Board
Control
Module
1
120Ω
5
6
7
X2
4986
WH
4987
BU
9

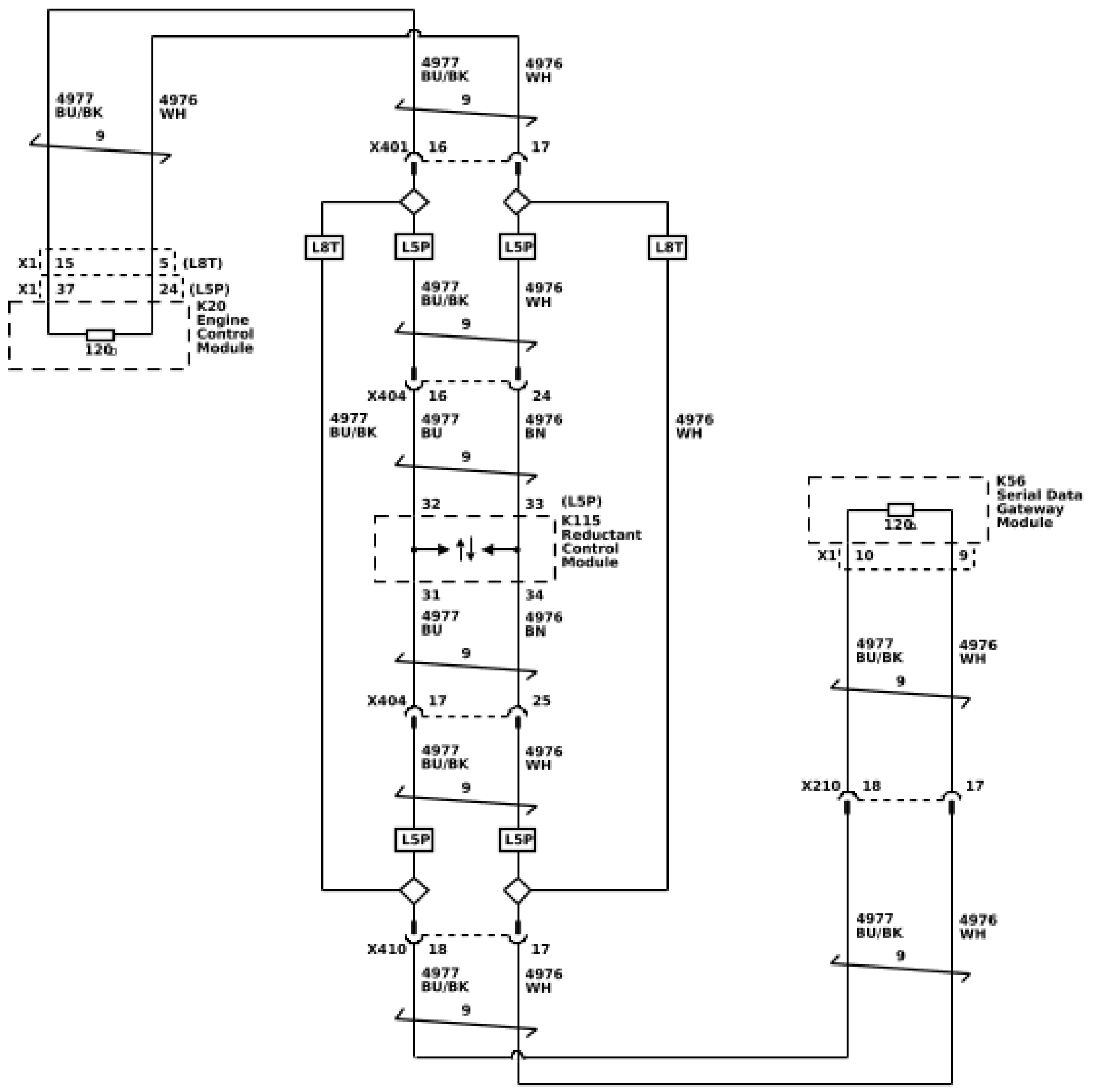
Data Communication Schematics (CAN 2 - 1 of 2)


6846305
-UEU
UEU
4 (UEU+GF2/GF5)
12(UEU-GF2/GF5)
5
13
X370B
X370A
B174W
Front View
Camera -
Windshield
6
8
5
7
46(UEU+GF2/GF5)
10(UEU-GF2/GF5)
47
11
F
E
K56
Serial Data
Gateway
Module
4978
WH
4979
BU/YE
9
Q5
Brake
Pressure
Modulator
Valve
K17
Electronic
Brake
Control
Module
20
19
8
7
52
51
X211
16
15
X410
K38
Chassis
Control
Module
37
34
36
35
G94
-G94
K20
Engine
Control
Module
120Ω
7 (L8T)
25 (L5P)
X1 17
X1 38
K71
Transmission
Control
Module
38
37
54
53
K69
Transfer Case
Control Module
4
3
16
15
NQF/NQH
-NQF/NQH
20
19
X401

Data Communication Schematics (CAN 2 - 2 of 2)

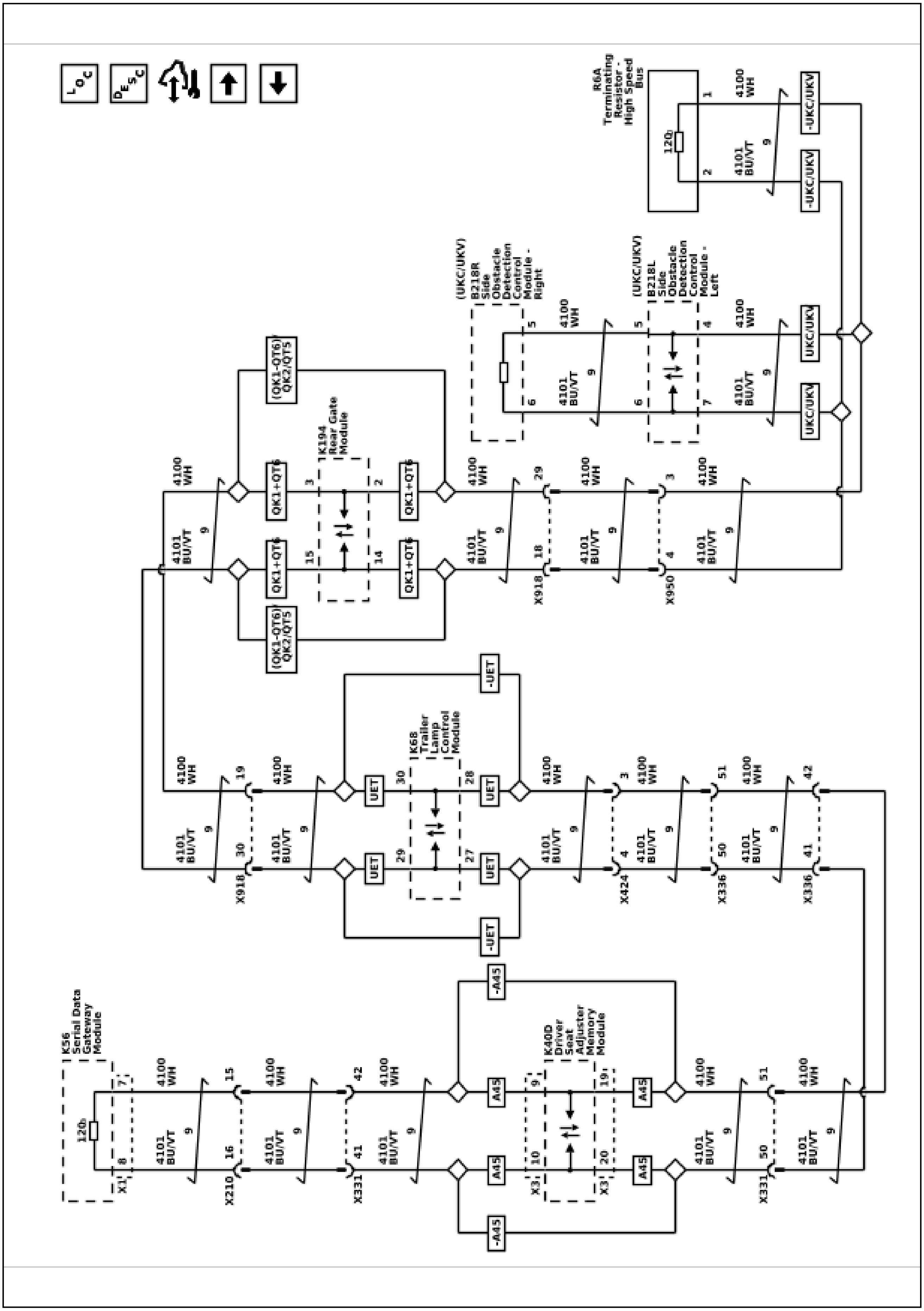

B174W
Front View
Camera -
Windshield
E
F
4979
BU/YE
4978
WH
9
X1
18
17
K56
Serial Data
Gateway
Module
X1
28
27
4979
BU/YE
4978
WH
9
X4
19
20
K9
Body
Control
Module
X5
13
12
4979
BU/YE
4978
WH
9
K219
Lighting
Control
Module
120Ω
X4
11
10
4979
BU/YE
4978
WH
9
X4
5
6
X4
3
4
4979
BU/YE
4978
WH
9
6846306

Data Communication Schematics (CAN 3)

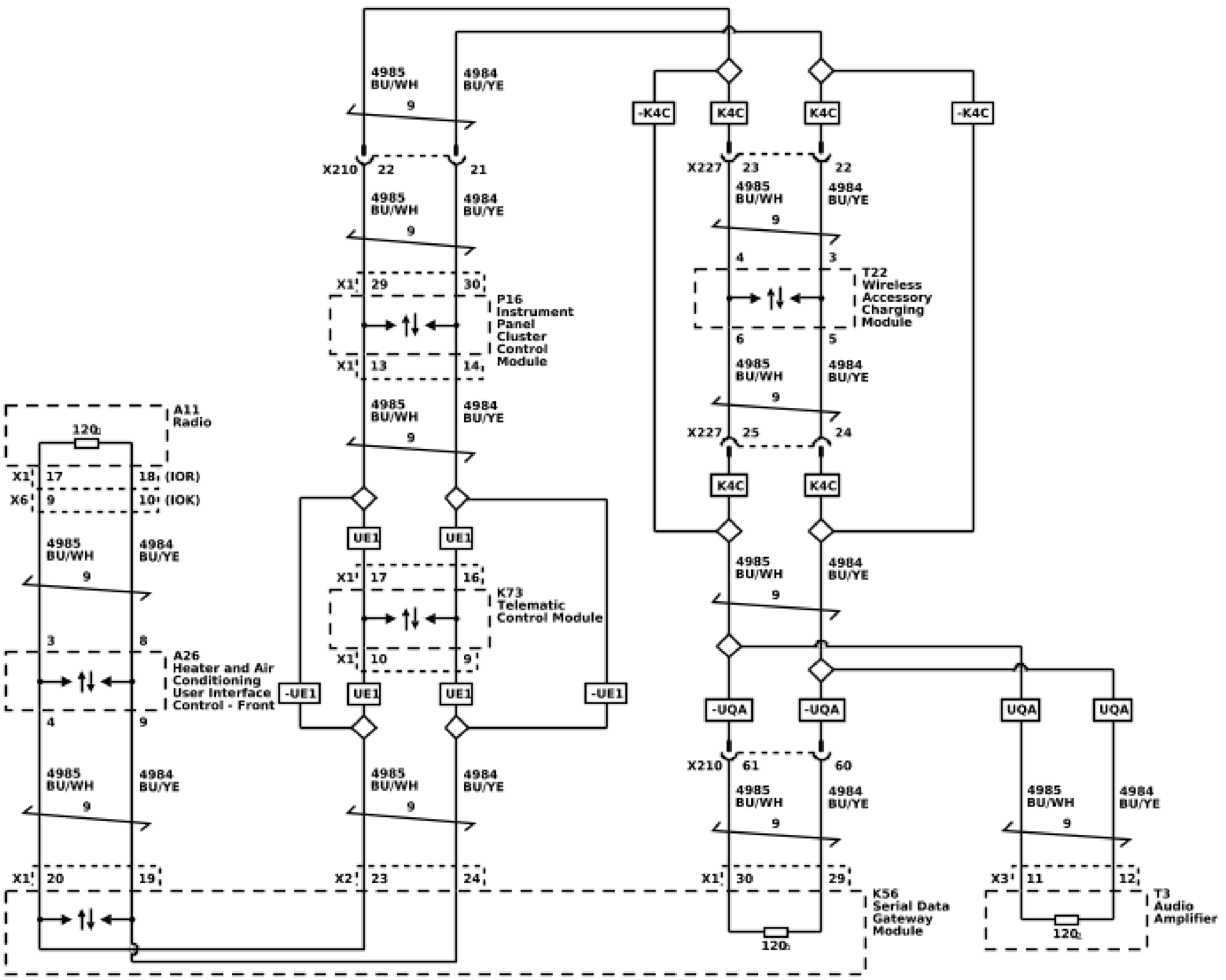

4977
BU/BK
4976
WH
9
X1 15
5 (L8T)
X1 37
24 (L5P)
K20
Engine
Control
Module
120Ω
4977
BU/BK
4976
WH
9
X401 16
17
L8T
L5P
L5P
L8T
4977
BU/BK
4976
WH
9
X404 16
24
4977
BU/BK
4977
BU
4976
BN
4976
WH
9
32
33 (L5P)
K115
Reductant
Control
Module
31
34
4977
BU
4976
BN
9
X404 17
25
4977
BU/BK
4976
WH
9
L5P
L5P
X410 18
17
4977
BU/BK
4976
WH
9
K56
Serial Data
Gateway
Module
120Ω
X1 10
9
4977
BU/BK
4976
WH
9
X210 18
17
4977
BU/BK
4976
WH
9

6846307

Data Communication Schematics (CAN 4)

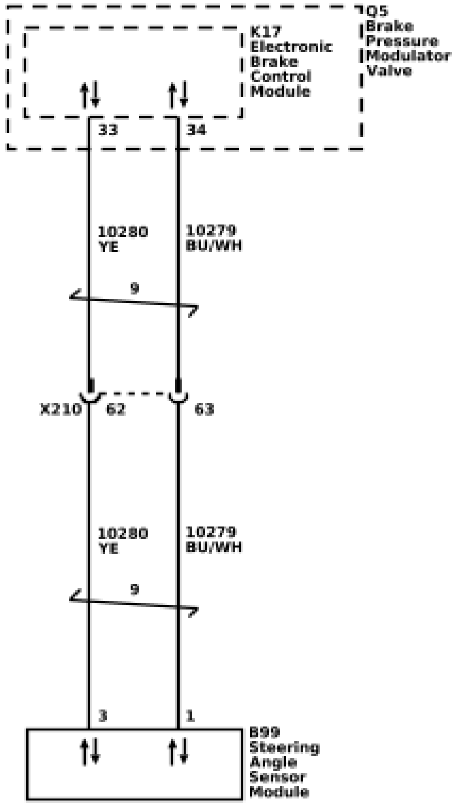

6846308
K56 Serial Data Gateway Module
120Ω
X1 7
X1 8
4100 WH
4101 BU/VT
9
X210 15
X210 16
X331 42
X331 41
A45
-A45
K40D Driver Seat Adjuster Memory Module
X3 9
X3 10
X3 19
X3 20
X331 51
X331 50
X918 19
X918 30
UET
-UET
K68 Trailer Lamp Control Module
30
29
28
27
X424 3
X424 4
X336 51
X336 50
X336 42
X336 41
QK1+QT6
(QK1-QT6) QK2/QT5
K194 Rear Gate Module
3
15
2
14
X918 29
X918 18
X950 3
X950 4
(UKC/UKV)
B218R Side Obstacle Detection Control Module - Right
5
6
B218L Side Obstacle Detection Control Module - Left
4
7
UKC/UKV
-UKC/UKV
R6A Terminating Resistor - High Speed Bus
1
2

Data Communication Schematics (CAN 5)


-K4C
K4C
X227
23
22
4985
BU/WH
4984
BU/YE
9
4
3
T22
Wireless
Accessory
Charging
Module
6
5
25
24
X210
21
X1
29
30
P16
Instrument
Panel
Cluster
Control
Module
13
14
A11
Radio
120Ω
17
18 (IOR)
X6
10 (IOK)
UE1
-UE1
16
K73
Telematic
Control Module
10
8
A26
Heater and Air
Conditioning
User Interface
Control - Front
-UQA
UQA
61
60
X2
20
19
X3
11
12
K56
Serial Data
Gateway
Module
T3
Audio
Amplifier

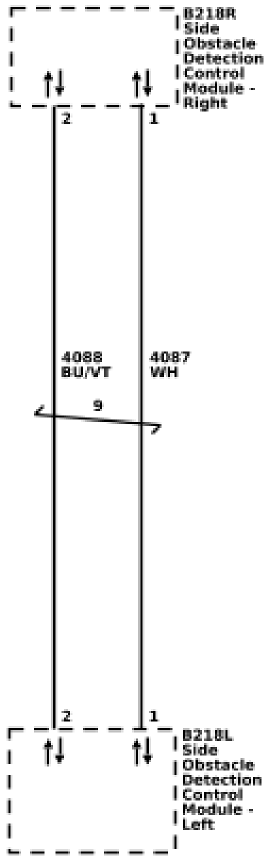
6846309

Data Communication Schematics (Private Steering Angle CAN)


Q5
Brake
Pressure
Modulator
Valve
K17
Electronic
Brake
Control
Module
33
34
10280
YE
10279
BU/WH
9
X210
62
63
10280
YE
10279
BU/WH
9
3
1
B99
Steering
Angle
Sensor
Module

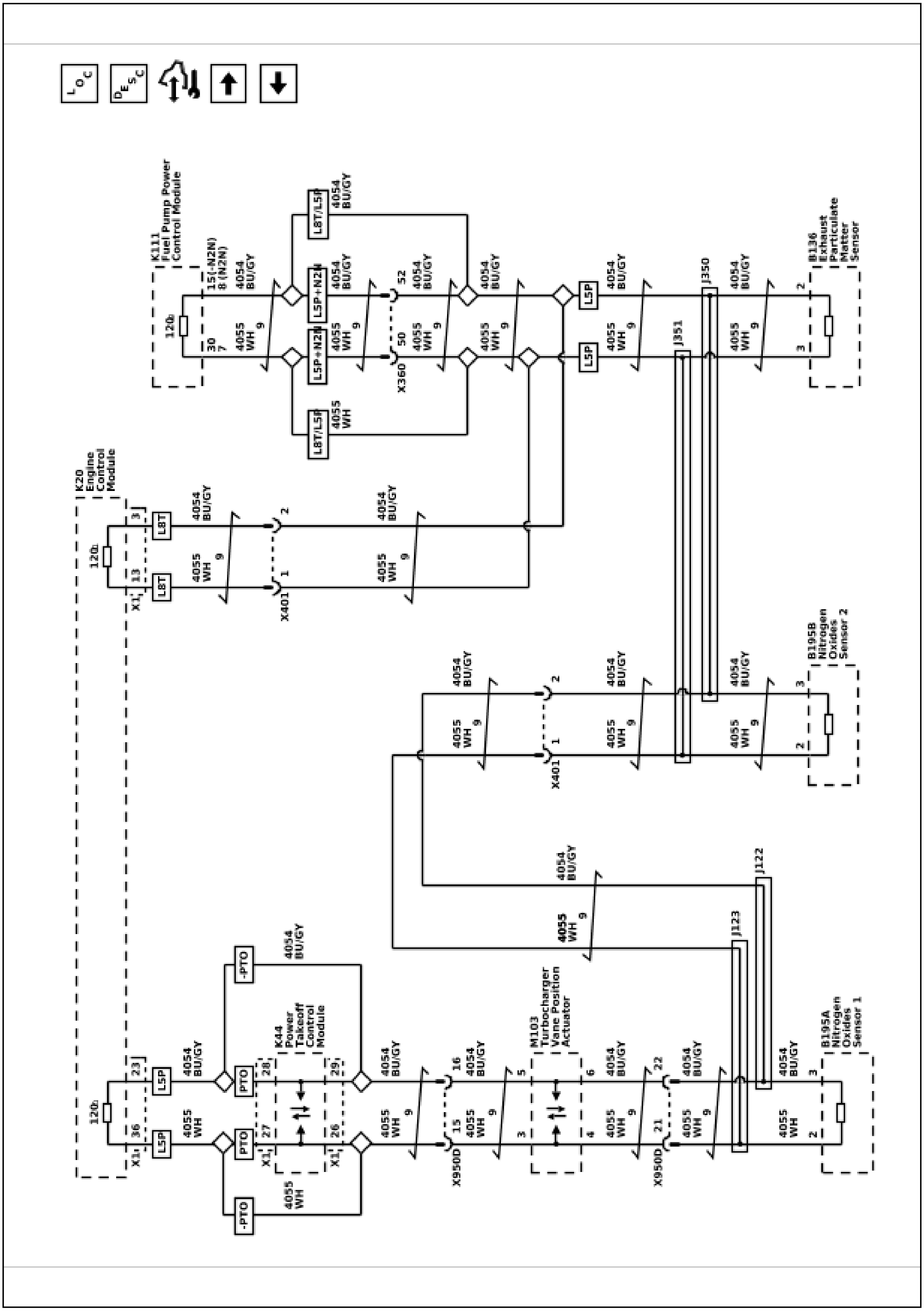
6846310

Data Communication Schematics (Private Serial Data Side Obstacle Detection Can)

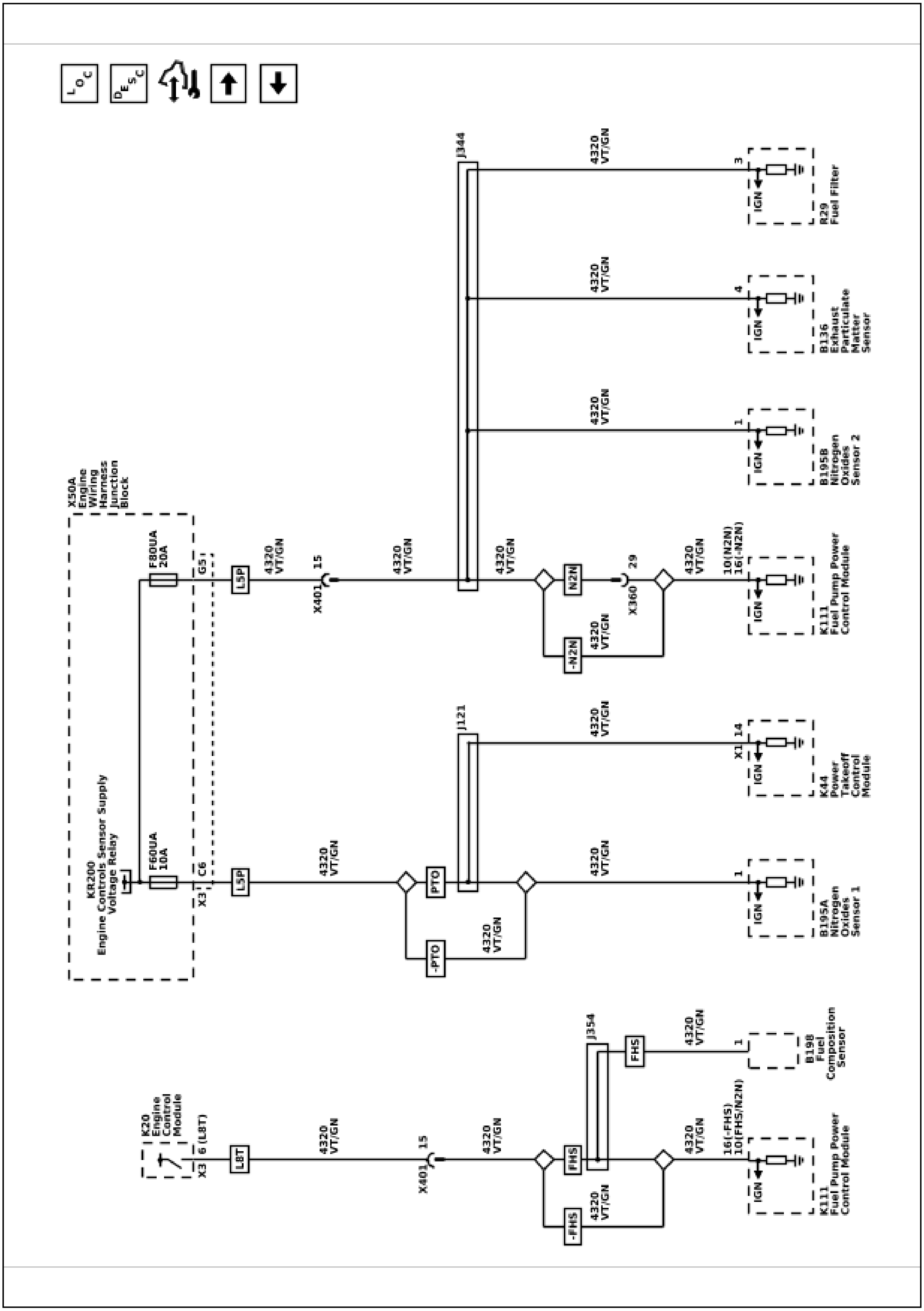

B218R
Side
Obstacle
Detection
Control
Module -
Right
2
1
4088
BU/VT
4087
WH
9
2
1
B218L
Side
Obstacle
Detection
Control
Module -
Left

6846311

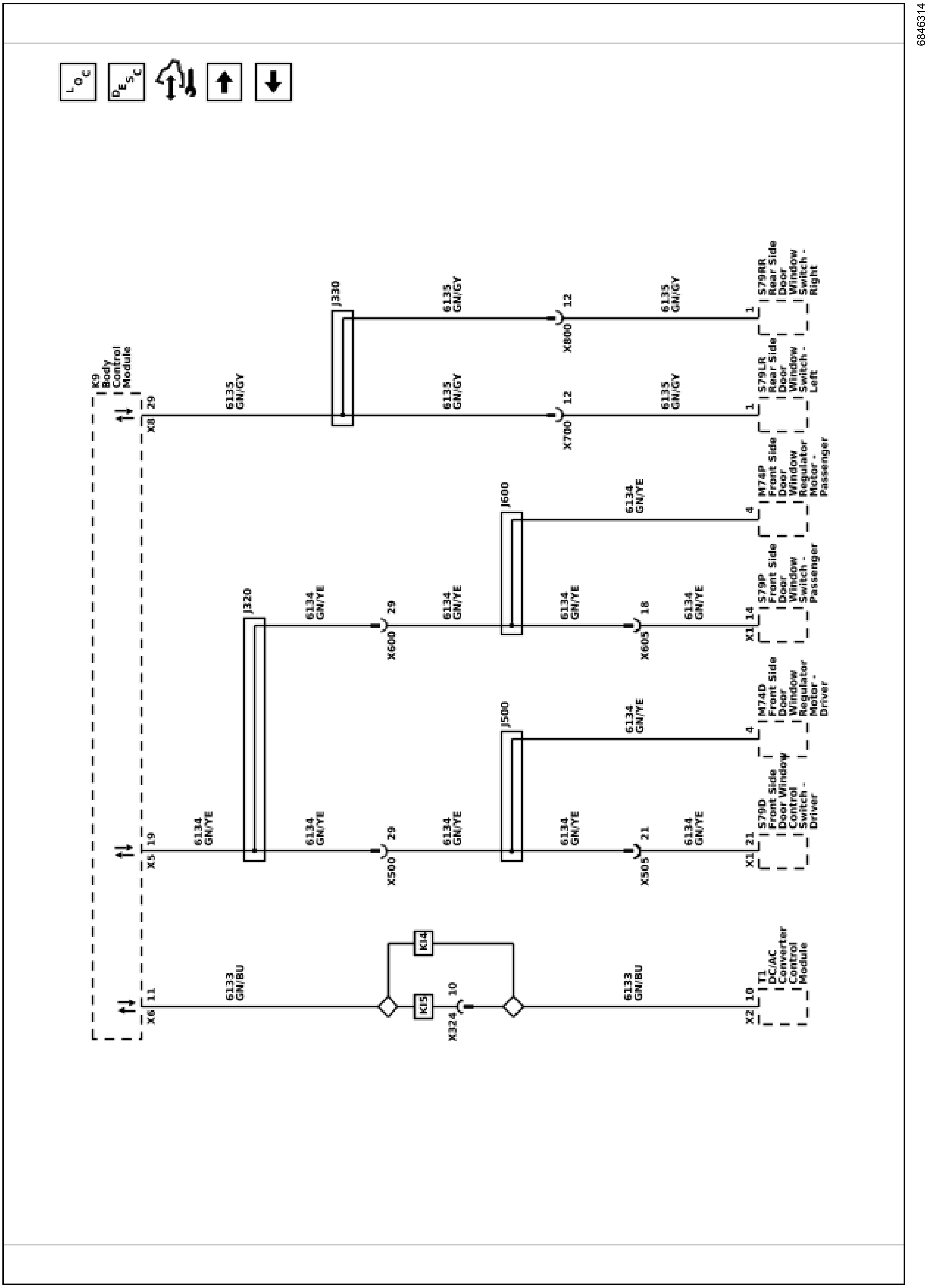
Data Communication Schematics (Powertrain CAN)


6846312
LOC
DESC
K111 Fuel Pump Power Control Module
120Ω
15(-N2N) 8 (N2N)
30 7
4054 BU/GY
4055 WH 9
L5P+N2N
L8T/L5P
52
50
X360
L5P
J350
J351
B136 Exhaust Particulate Matter Sensor
2
3
K20 Engine Control Module
X1
3
13
L8T
X401
1
2
B195B Nitrogen Oxides Sensor 2
J122
J123
K44 Power Takeoff Control Module
PTO
-PTO
23
36
28
27
29
26
X950D
16
15
M103 Turbocharger Vane Position Actuator
5
3
6
4
22
21
B195A Nitrogen Oxides Sensor 1

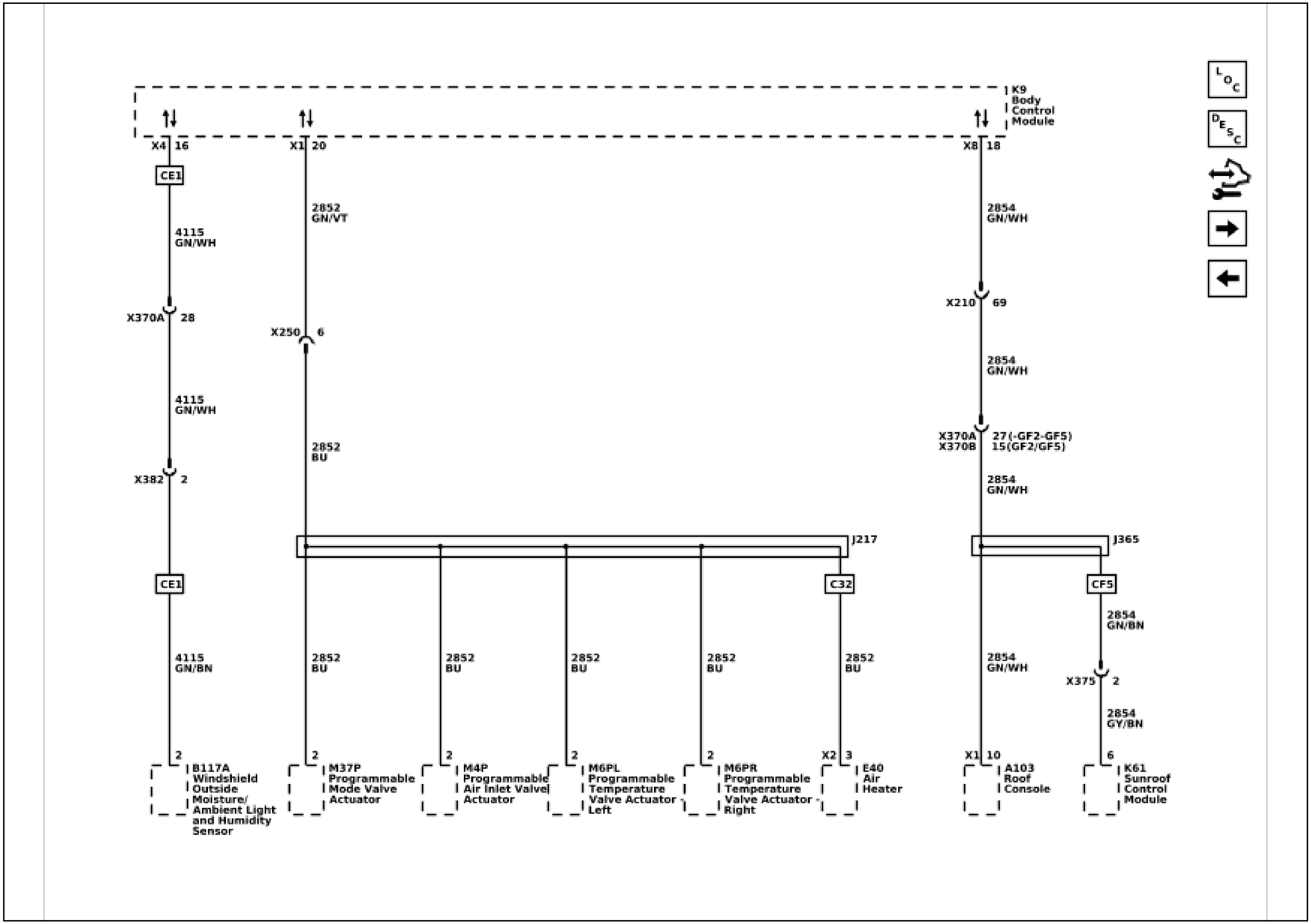
Data Communication Schematics (Powertrain CAN Enable)


6846313
LOC
DESC
X50A Engine Wiring Harness Junction Block
KR200 Engine Controls Sensor Supply Voltage Relay
F80UA 20A
F60UA 10A
G5
X3 C6
L5P
L8T
4320 VT/GN
15
X401
29
X360
J344
J121
J354
N2N
-N2N
PTO
-PTO
FHS
-FHS
K20 Engine Control Module
X3 6 (L8T)
3
4
1
X1 14
10(N2N) 16(-N2N)
16(-FHS) 10(FHS/N2N)
IGN
R29 Fuel Filter
B136 Exhaust Particulate Matter Sensor
B195B Nitrogen Oxides Sensor 2
K111 Fuel Pump Power Control Module
K44 Power Takeoff Control Module
B195A Nitrogen Oxides Sensor 1
B198 Fuel Composition Sensor

Data Communication Schematics (Body Control Module Local Interconnect Network LIN Busses 2, 3, and 4)

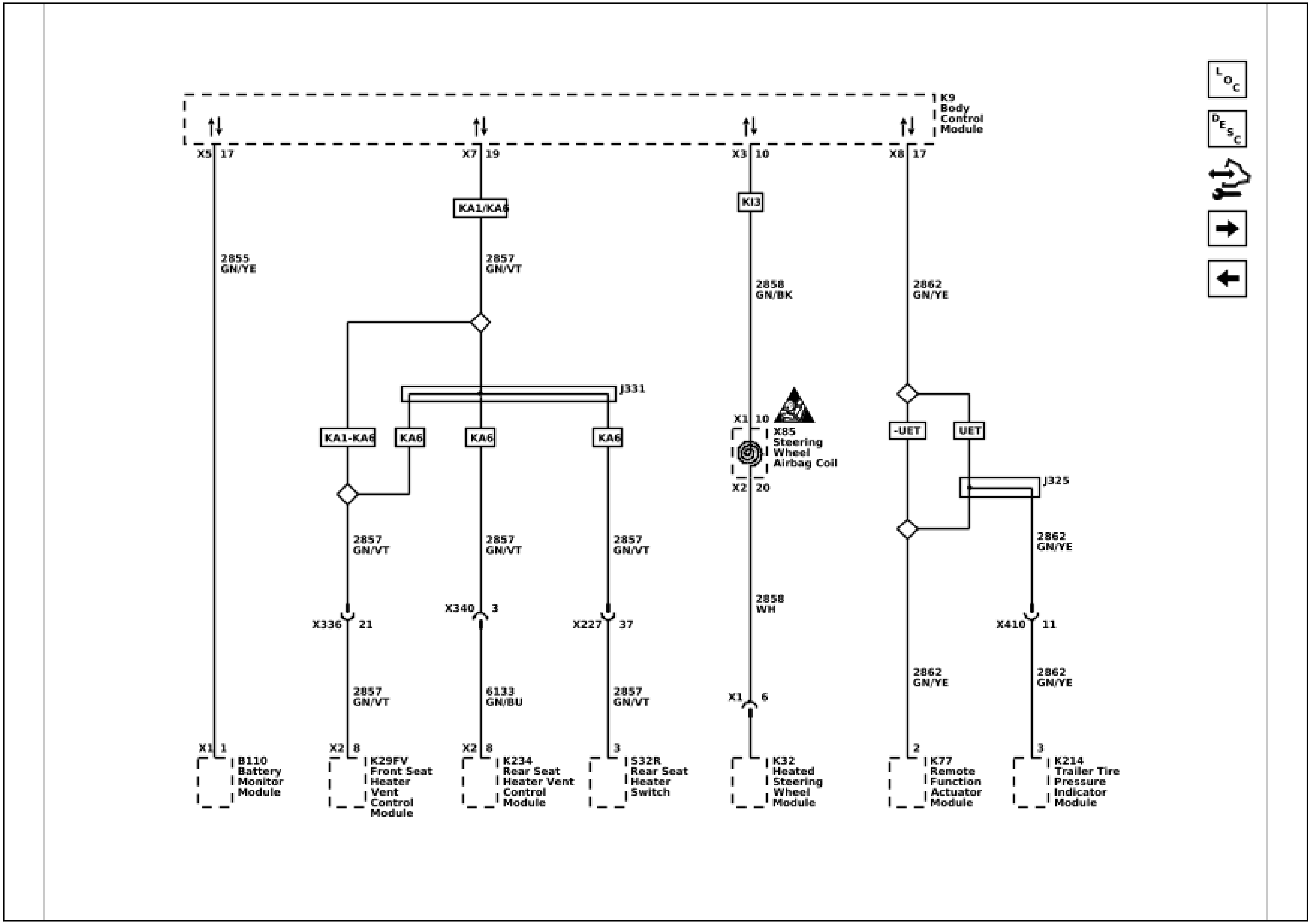

6846314
K9 Body Control Module
X6 11
X5 19
X8 29
6133 GN/BU
6134 GN/YE
6135 GN/GY
KI4
KI5
X324 10
J320
J330
J500
J600
X500 29
X600 29
X505 21
X605 18
X700 12
X800 12
X2 10
T1 DC/AC Converter Control Module
X1 21
S79D Front Side Door Window Control Switch - Driver
4
M74D Front Side Door Window Regulator Motor - Driver
X1 14
S79P Front Side Door Window Switch - Passenger
M74P Front Side Door Window Regulator Motor - Passenger
1
S79LR Rear Side Door Window Switch - Left
S79RR Rear Side Door Window Switch - Right

Data Communication Schematics (Body Control Module Local Interconnect Network LIN Busses 5, 6, and 8)

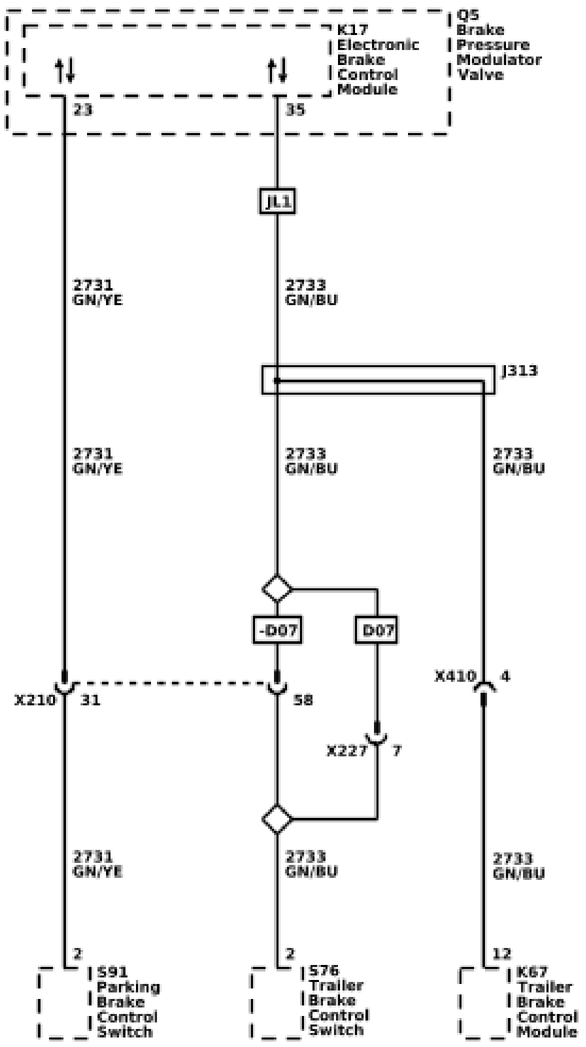

K9
Body
Control
Module
X4 16
X1 20
X8 18
CE1
4115
GN/WH
X370A 28
4115
GN/WH
X382 2
CE1
4115
GN/BN
2
B117A
Windshield
Outside
Moisture/
Ambient Light
and Humidity
Sensor
2852
GN/VT
X250 6
2852
BU
J217
2852
BU
2
M37P
Programmable
Mode Valve
Actuator
2852
BU
2
M4P
Programmable
Air Inlet Valve
Actuator
2852
BU
2
M6PL
Programmable
Temperature
Valve Actuator -
Left
2852
BU
2
M6PR
Programmable
Temperature
Valve Actuator -
Right
C32
2852
BU
X2 3
E40
Air
Heater
2854
GN/WH
X210 69
2854
GN/WH
X370A 27(-GF2-GF5)
X370B 15(GF2/GF5)
2854
GN/WH
J365
2854
GN/WH
X1 10
A103
Roof
Console
CF5
2854
GN/BN
X375 2
2854
GY/BN
6
K61
Sunroof
Control
Module

6846315

Data Communication Schematics (Body Control Module Local Interconnect Network LIN Busses 9, 11, 12, and 16)

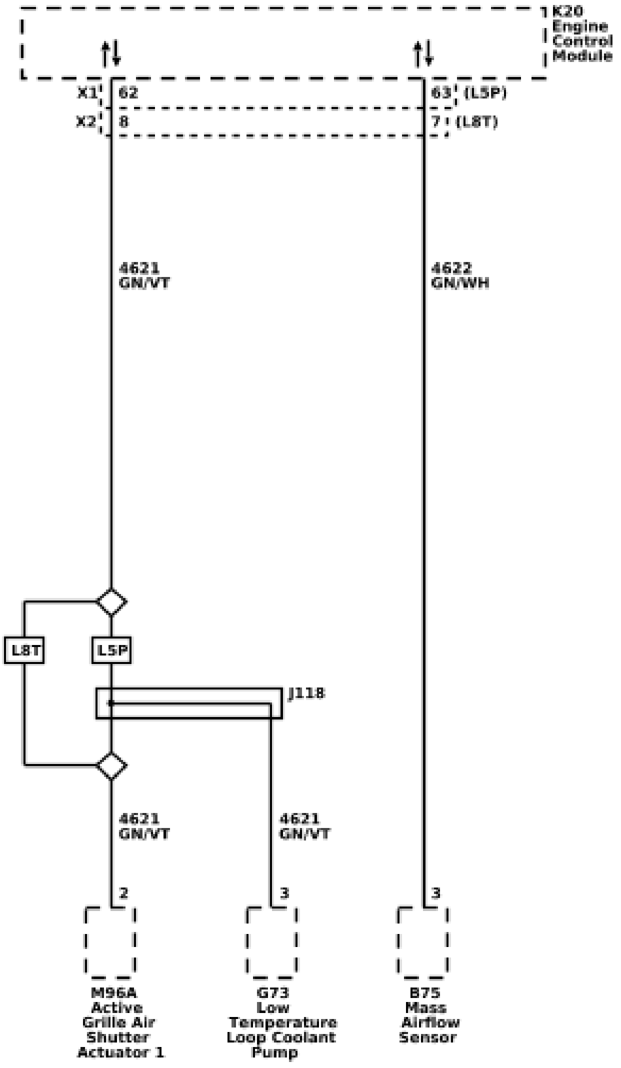

K9 Body Control Module
X5 17
X7 19
X3 10
X8 17
KA1/KA6
KI3
2855 GN/YE
2857 GN/VT
2858 GN/BK
2862 GN/YE
J331
KA1-KA6
KA6
KA6
KA6
X1 10
X85 Steering Wheel Airbag Coil
X2 20
-UET
UET
J325
2857 GN/VT
2857 GN/VT
2857 GN/VT
2862 GN/YE
2858 WH
X336 21
X340 3
X227 37
X410 11
2857 GN/VT
6133 GN/BU
2857 GN/VT
2862 GN/YE
2862 GN/YE
X1 6
X1 1
B110 Battery Monitor Module
X2 8
K29FV Front Seat Heater Vent Control Module
X2 8
K234 Rear Seat Heater Vent Control Module
3
S32R Rear Seat Heater Switch
K32 Heated Steering Wheel Module
2
K77 Remote Function Actuator Module
3
K214 Trailer Tire Pressure Indicator Module
6846316

Data Communication Schematics (Brake System Control Module Local Interconnect Network LIN Busses)

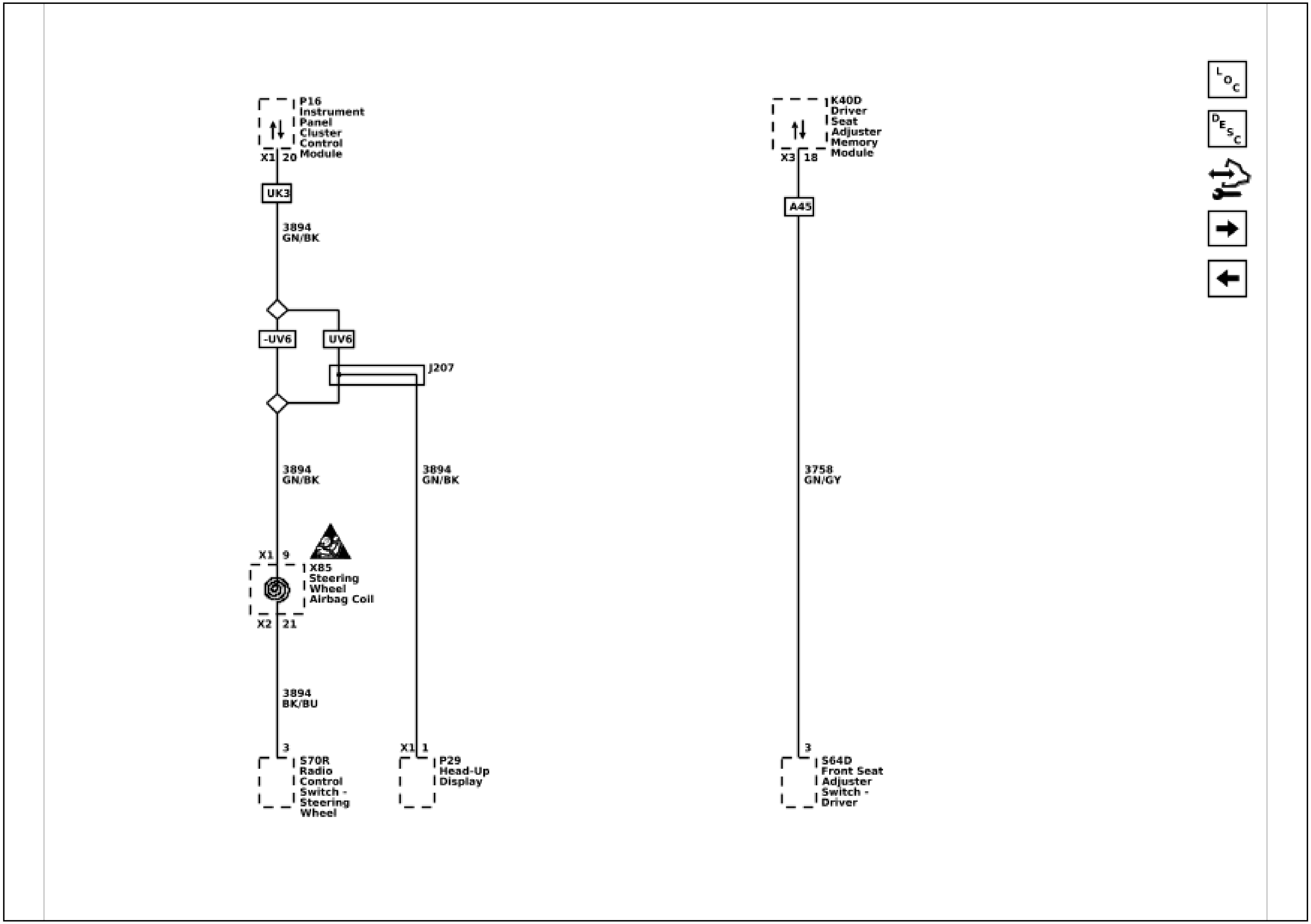

Q5
Brake
Pressure
Modulator
Valve
K17
Electronic
Brake
Control
Module
23
35
JL1
2731
GN/YE
2733
GN/BU
J313
2731
GN/YE
2733
GN/BU
2733
GN/BU
-D07
D07
X210
31
58
X410
4
X227
7
2731
GN/YE
2733
GN/BU
2733
GN/BU
2
S91
Parking
Brake
Control
Switch
2
S76
Trailer
Brake
Control
Switch
12
K67
Trailer
Brake
Control
Module

6846317

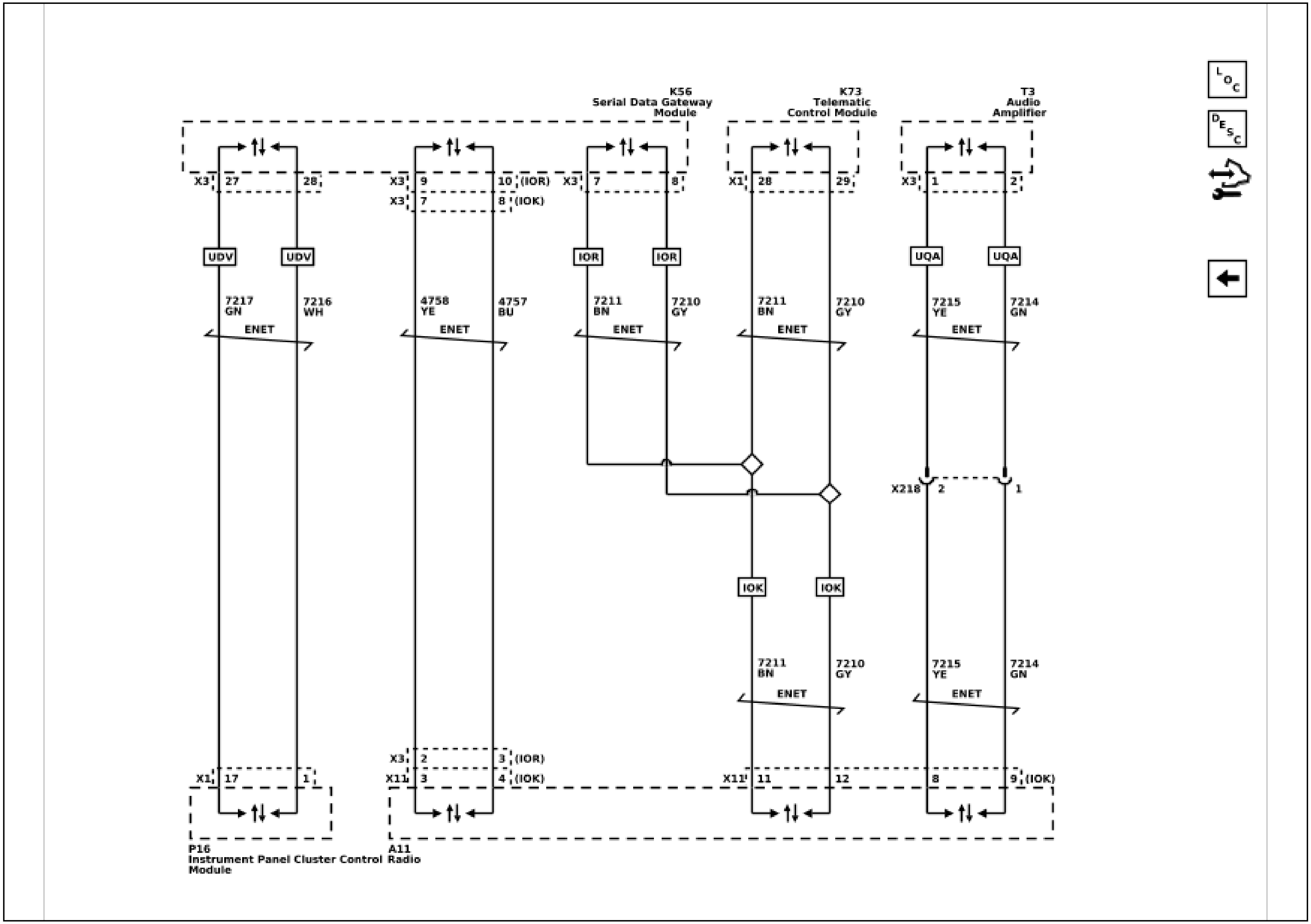
Data Communication Schematics (Engine Control Module Local Interconnect Network LIN Busses)


K20
Engine
Control
Module
X1 62
X2 8
63 (L5P)
7 (L8T)
4621
GN/VT
4622
GN/WH
L8T
L5P
J118
4621
GN/VT
4621
GN/VT
2
3
3
M96A
Active
Grille Air
Shutter
Actuator 1
G73
Low
Temperature
Loop Coolant
Pump
B75
Mass
Airflow
Sensor
6846318

Data Communication Schematics (Instrument Panel Cluster, and Seat Memory Module Local Interconnect Network (LIN) Busses)

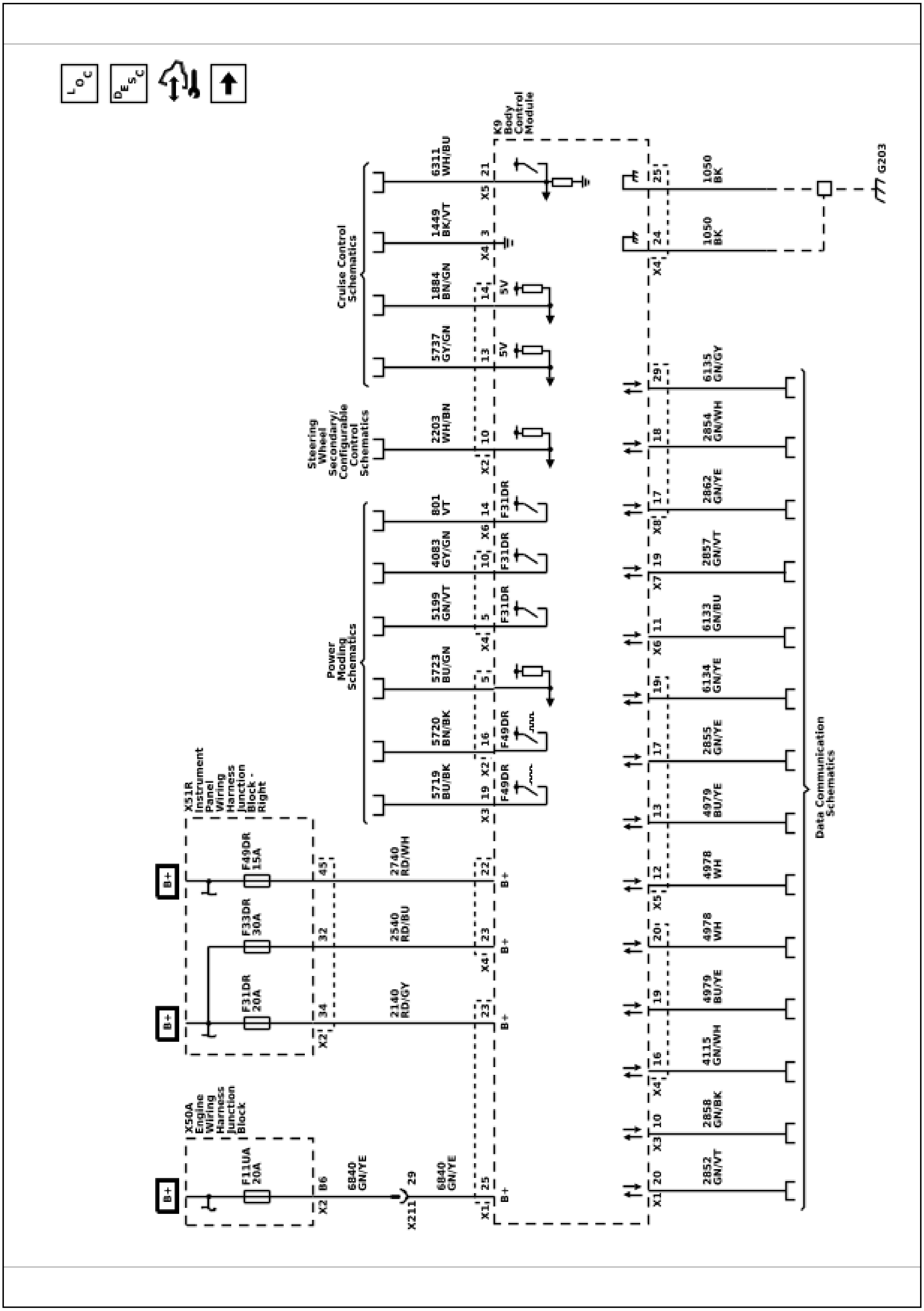

P16
Instrument
Panel
Cluster
Control
Module
X1 20
UK3
3894
GN/BK
-UV6
UV6
J207
3894
GN/BK
3894
GN/BK
X1 9
X85
Steering
Wheel
Airbag Coil
X2 21
3894
BK/BU
3
S70R
Radio
Control
Switch -
Steering
Wheel
X1 1
P29
Head-Up
Display
K40D
Driver
Seat
Adjuster
Memory
Module
X3 18
A45
3758
GN/GY
3
S64D
Front Seat
Adjuster
Switch -
Driver
6846319

Data Communication Schematics (Ethernet Bus)


K56
Serial Data Gateway
Module
K73
Telematic
Control Module
T3
Audio
Amplifier
X3 27
28
X3 9
10 (IOR)
X3 7
8 (IOK)
X3 7
8
X1 28
29
X3 1
2
UDV
UDV
IOR
IOR
UQA
UQA
7217
GN
7216
WH
4758
YE
4757
BU
7211
BN
7210
GY
7211
BN
7210
GY
7215
YE
7214
GN
ENET
X218 2
1
IOK
IOK
7211
BN
7210
GY
7215
YE
7214
GN
ENET
X3 2
3 (IOR)
X1 17
1
X11 3
4 (IOK)
X11 11
12
8
9 (IOK)
P16
Instrument Panel Cluster Control
Module
A11
Radio

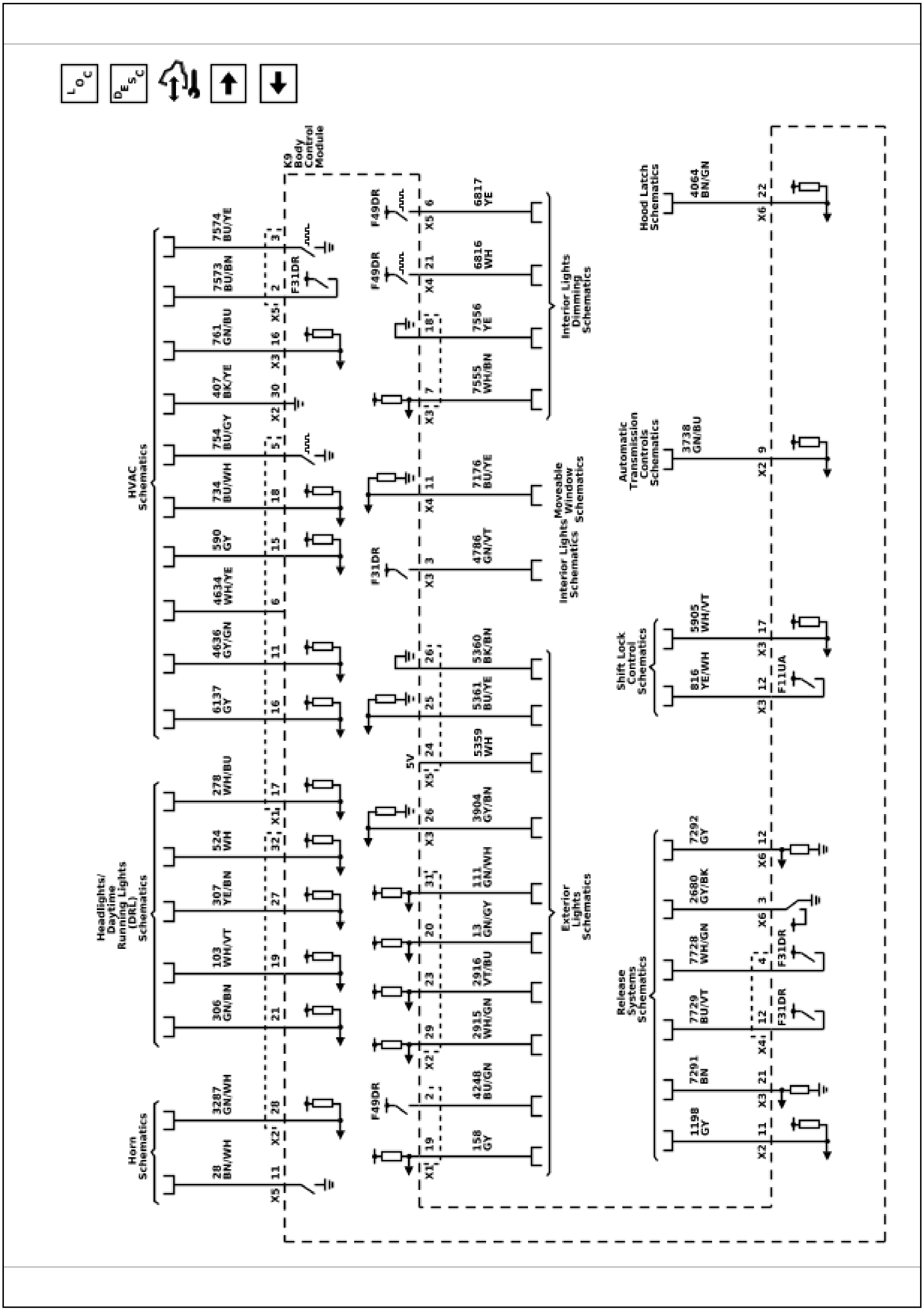
6846320

Body Control System Schematics (Power, Ground, Serial Data, and Subsystem References - 1 of 3)

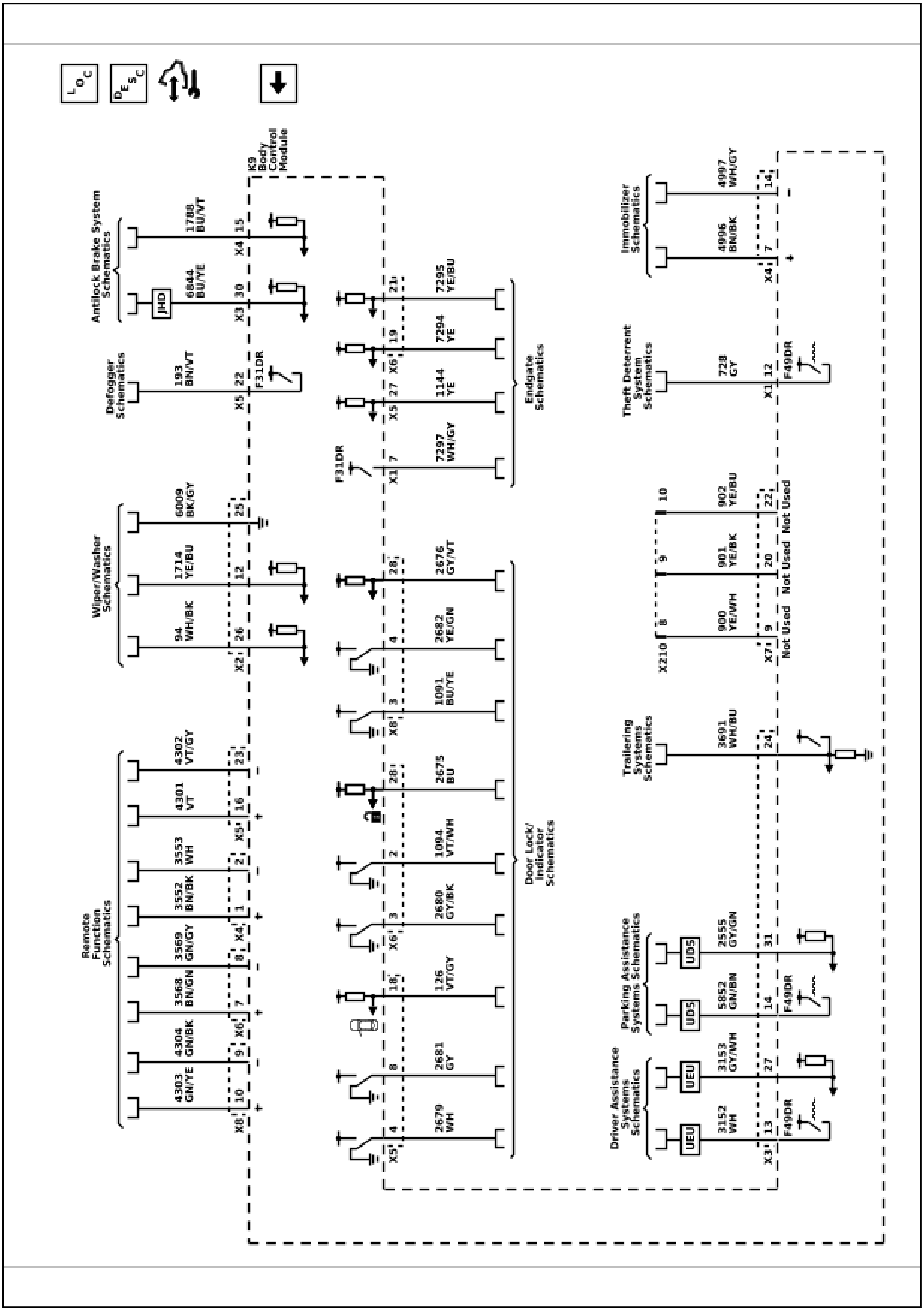


6846321
B+
X50A Engine Wiring Harness Junction Block
F11UA 20A
X2 B6
6840 GN/YE
X211 29
6840 GN/YE
X1 25 B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F31DR 20A
F33DR 30A
F49DR 15A
X2 34
32
45
2140 RD/GY
2540 RD/BU
2740 RD/WH
23 B+
X4 23 B+
22 B+
Power Moding Schematics
5719 BU/BK
5720 BN/BK
5723 BU/GN
5199 GN/VT
4083 GY/GN
801 VT
X3 19 F49DR
X2 16 F49DR
5
X4 5 F31DR
10 F31DR
X6 14 F31DR
Steering Wheel Secondary/Configurable Control Schematics
2203 WH/BN
X2 10
Cruise Control Schematics
5737 GY/GN
1884 BN/GN
1449 BK/VT
6311 WH/BU
13 5V
14 5V
X4 3
X5 21
K9 Body Control Module
X4 24
25
1050 BK
1050 BK
G203
X1 20
X3 10
X4 16
19
20
X5 12
13
17
19
X6 11
X7 19
X8 17
18
29
2852 GN/VT
2858 GN/BK
4115 GN/WH
4979 BU/YE
4978 WH
4978 WH
4979 BU/YE
2855 GN/YE
6134 GN/YE
6133 GN/BU
2857 GN/VT
2862 GN/YE
2854 GN/WH
6135 GN/GY
Data Communication Schematics

Body Control System Schematics (Subsystem References - 2 of 3)


6846322
LOC
DESC
K9 Body Control Module
Horn Schematics
28 BN/WH
X5 11
3287 GN/WH
X2 28
Headlights/Daytime Running Lights (DRL) Schematics
306 GN/BN
21
103 WH/VT
19
307 YE/BN
27
524 WH
32
278 WH/BU
X1 17
HVAC Schematics
6137 GY
16
4636 GY/GN
11
4634 WH/YE
6
590 GY
15
734 BU/WH
18
754 BU/GY
5
407 BK/YE
X2 30
761 GN/BU
X3 16
7573 BU/BN
X5 2
F31DR
7574 BU/YE
3
F49DR
X1 19
158 GY
2
4248 BU/GN
X2 29
2915 WH/GN
23
2916 VT/BU
20
13 GN/GY
31
111 GN/WH
X3 26
3904 GY/BN
X5 24
5V
5359 WH
25
5361 BU/YE
26
5360 BK/BN
Exterior Lights Schematics
F31DR
X3 3
4786 GN/VT
Interior Lights Schematics
X4 11
7176 BU/YE
Moveable Window Schematics
X3 7
7555 WH/BN
18
7556 YE
F49DR
X4 21
6816 WH
F49DR
X5 6
6817 YE
Interior Lights Dimming Schematics
Release Systems Schematics
X2 11
1198 GY
X3 21
7291 BN
X4 12
7729 BU/VT
F31DR
4
7728 WH/GN
F31DR
X6 3
2680 GY/BK
X6 12
7292 GY
Shift Lock Control Schematics
X3 12
816 YE/WH
F11UA
X3 17
5905 WH/VT
Automatic Transmission Controls Schematics
X2 9
3738 GN/BU
Hood Latch Schematics
X6 22
4064 BN/GN

Body Control System Schematics (Subsystem References - 3 of 3)


6846323
K9 Body Control Module
Antilock Brake System Schematics
1788 BU/VT
X4 15
6844 BU/YE
JHD
X3 30
Defogger Schematics
193 BN/VT
X5 22
F31DR
Wiper/Washer Schematics
6009 BK/GY
25
1714 YE/BU
12
94 WH/BK
X2 26
Remote Function Schematics
4302 VT/GY
23
4301 VT
X5 16
3553 WH
2
3552 BN/BK
1
3569 GN/GY
X4 8
3568 BN/GN
7
4304 GN/BK
X6 9
4303 GN/YE
X8 10
Endgate Schematics
7295 YE/BU
21
7294 YE
X6 19
1144 YE
X5 27
7297 WH/GY
X1 7
F31DR
Door Lock/Indicator Schematics
2676 GY/VT
28
2682 YE/GN
4
1091 BU/YE
X8 3
2675 BU
28
1094 VT/WH
2
2680 GY/BK
X6 3
126 VT/GY
18
2681 GY
8
2679 WH
X5 4
Immobilizer Schematics
4997 WH/GY
14
4996 BN/BK
X4 7
Theft Deterrent System Schematics
728 GY
X1 12
F49DR
X210 8 9 10
902 YE/BU
22
901 YE/BK
20
900 YE/WH
X7 9
Not Used
Not Used
Not Used
Trailering Systems Schematics
3691 WH/BU
24
Parking Assistance Systems Schematics
2555 GY/GN
UD5
31
5852 GN/BN
UD5
14
F49DR
Driver Assistance Systems Schematics
3153 GY/WH
UEU
27
3152 WH
UEU
X3 13
F49DR

Description and Operation

Data Link Communications Description and Operation

Note: This is an overview of different serial data buses used by control modules to communicate with each others. Use *Data Communication Schematics 8-3* to find out which serial data buses are configured for a specific vehicle.

Vehicle Intelligence Platform (VIP) Data Link Communications Overview

There are many components in a vehicle that rely on information from other sources, transmit information to other sources, or both. Serial data communication networks provide a reliable, cost effective, way for various components of the vehicle to “talk” to one another and share information.

General Motors uses a number of different communication buses to ensure the timely and efficient exchange of information between control modules. When compared to each other, some of these buses are different in nature as far as speed, signal characteristics, and behavior.

On the other hand, when other buses are compared to each other they have similar characteristics and simply operate in parallel. In this case they are used to group together components which have high interaction. Examples are the Controller Area Network (CAN), private CAN, and Local Interconnect Network (LIN) buses. This allows them to communicate with each other on a bus with reduced message congestion insuring faster and the more timely exchange of information than if all vehicle control modules were on a single bus.

The majority of information that exists within a given network generally stays local; however some information will have to be shared on other networks. Control modules designated as Gateways perform the function of transferring information between the various buses. A Gateway module is connected to at least 2 buses and will interact with each network according to its message strategy and transmission models.

CAN provides the capability for a receiving control module to monitor message transmissions from other control modules in order to determine if messages of interest are not being received. The primary purpose is to allow reasonable default values to be substituted for the information no longer being received. Additionally, a control module may set a Diagnostic Trouble Code (DTC) to indicate that the control module it is expecting information from is no longer communicating.

K9 Body Control Module (BCM)

The body control system consists of the K9 Body Control Module, communications, and various input and outputs. Some inputs, outputs and messages require other control modules to interact with the K9 Body Control Module. The K9 Body Control Module also has discrete input and output terminals to control the vehicle's body functions. The K9 Body Control Module is wired to CAN bus and multiple LIN buses and acts as a gateway between them.

The various K9 Body Control Module input and output circuits are illustrated in the corresponding functional areas on the K9 Body Control Module electrical schematics. Refer to the *Body Control System Schematics 8-23* for more detailed information.

K56 Serial Data Gateway Module

The K56 Serial Data Gateway Module gates messages between the CAN networks described in the Controller Area Network (CAN) Bus Description section below. The K56 Serial Data Gateway Module needs to know what CAN control modules are present on a given vehicle in order to enable/disable loss of communication DTCs and to know which CAN control modules to track for their communication status. The K56 Serial Data Gateway Module has the ability to learn the diagnostic addresses list of CAN control modules to identify what CAN control modules are equipped on the vehicle and what CAN buses they are on. If the K56 Serial Data Gateway Module is replaced, this learn/verification process will have to be done again through K56 Serial Data Gateway Module programming and setup procedure in SPS. This learn process will not cause any previously learned contents to be forgotten/overwritten. If the learn process is not done on a new K56 Serial Data Gateway Module, DTC U1977 will be set until the learn procedure is executed. If the learn is invalid due to control module internal malfunction or a K56 Serial Data Gateway Module swap, DTC U3000 42 or DTC U3002 56 will be set. If any of these DTCs sets, the K56 Serial Data Gateway Module will enable loss of communication for all CAN control modules. This will result in loss of communication DTCs being set against CAN control modules that are not equipped on the vehicle.

A fault can be localized by monitoring the normal mode messages on a CAN bus. The K56 Serial Data Gateway Module will monitor one signal per CAN control module per CAN bus to determine control module status. When a signal times out, a loss of communication event will be started.

Controller Area Network (CAN) Bus Description

The CAN buses are used where data needs to be exchanged at a high enough rate to minimize the delay between the occurrence of a change in sensor value and the reception of this information by a control device using the information to adjust vehicle system performance.

Each CAN serial data network consists of two twisted wires. One signal circuit is identified as CAN-High and the other signal circuit is identified as CAN-Low. At each end of the data bus there is a 124 Ω termination resistor between the CAN-High and CAN-Low circuits. Most CAN control modules have an internal resistance of 4.950K Ω. There may be one or two CAN control modules that have a higher internal resistance like the K60 Column Lock Module which has an internal resistance of 77.4K Ω. The internal resistance of CAN control modules causes lower terminating resistor reading when splitting the CAN network to check for faults. The more CAN control modules on the network the lower the terminating resistor will read.

The data to be transmitted over a CAN bus is represented by the voltage difference between the CAN-High signal voltage and the CAN-Low signal voltage. Data symbols (1’s and 0’s) are transmitted sequentially at the following rate:

- CAN 1 (circuits 4986 & 4987) = 500 Kbit/s
- CAN 2 (circuits 4978 & 4979) = 2 Mbit/s
- CAN 3 (circuits 4976 & 4977) = 500 Kbit/s
- CAN 4 (circuits 4100 & 4101) = 500 Kbit/s
- CAN 5 (circuits 4984 & 4985) = 500 Kbit/s
- CAN 6 (circuits 4980 & 4981) = 5 Mbit/s
- CAN 7 (circuits 4982 & 4983) = 5 Mbit/s
- CAN 8 (circuits 4104 & 4105) = 2 Mbit/s
- CAN 9 (circuits 4102 & 4103) = 2 Mbit/s
- CAN 10 (circuits 10800 & 10801) = 2 Mbit/s

Classical CAN: CAN 1, CAN 3, CAN 4, and CAN 5 are Classical CAN buses. In Classical CAN, the entire message is transmitted at the same baud rate. The size of the data field is limited to 8 bytes.

CAN FD: CAN 2, CAN 8, CAN 9, and CAN 10 are CAN FD buses (FD = Flexible Data-Rate). In CAN FD, the data field of the message is transmitted at the same or at a faster baud rate. The size of the data field can be up to 64 bytes in length.

When the two wire bus is at rest the CAN-High and CAN-Low signal circuits are not being driven and this represents a logic “1”. In this state both signal circuits are at the same voltage of 2.5 V. The differential voltage is approximately 0 V.

When a logic “0” is to be transmitted, the CAN-High signal circuit is driven higher to about 3.5 V and the CAN-Low circuit is driven lower to about 1.5 V. The differential voltage becomes approximately 2.0 (+/- 0.5) V.

The CAN 1, CAN 2, CAN 3, CAN 4, CAN 5, CAN 8, CAN 9, and CAN 10 buses are used to communicate between the K56 Serial Data Gateway Module and other CAN control modules.

The CAN 8 and CAN 9 buses are reserved for the following systems:

- The CAN 8 bus is reserved for most control modules and sensors related to active safety system, if applicable.
- The CAN 9 bus is reserved for most control modules and sensors related to Hybrid/EV system, if applicable.

The following CAN buses are between the X84 Data Link Connector and the K56 Serial Data Gateway Module:

- The CAN 6 bus is used for CAN diagnostics and programming.
- The CAN 7 bus is used for programming by assembly plant only.
- The Private Presentation CAN 1 bus (circuits 2577 & 2578) is used by Engineering to observe data communications on CAN buses not directly accessible at the X84 Data Link Connector. It requires special security access and will not be used in a service environment.
- The Private Presentation CAN 2 bus (circuits 2579 & 2580) is used by Engineering to observe data communications on CAN buses not directly accessible at the X84 Data Link Connector. It requires special security access and will not be used in a service environment.

Private Powertrain CAN Bus Description

The Private Powertrain CAN bus (circuits 4054 & 4055) is reserved for Powertrain components. It has a transmission rate of 500 Kbit/s. Sometimes communication is required between the Private Powertrain CAN bus and another CAN bus. This is accomplished by using the K20 Engine Control Module / K45 Powertrain Control Module (for gas vehicles) or K16 Battery Energy Control Module (for electric vehicles) as the Gateway module. Since the Private Powertrain CAN bus and other CAN buses operate in the same manner, the diagnostics for each are similar.

Local Interconnect Network (LIN) Bus Description

The LIN Bus consists of a single wire with a transmission rate of 10.417 Kbit/s or 19.23 Kbit/s. This bus is used to exchange information between a master control module and other smart devices which provide supporting functionality. This type of configuration does not require the capacity or speed of a CAN bus and is thus relatively simpler.

The data symbols (1's and 0's) to be transmitted are represented by different voltage levels on the communication bus. When the LIN Bus is at rest and is not being driven, the signal is in a high voltage state of approximately Vbatt. This represents a logic "1". When a logic "0" is to be transmitted, the signal voltage is driven low to about ground (0.0 V).

Ethernet Bus Description

Ethernet is a data communication technology that uses a single twisted copper pair of wires at speeds of 100 Mbit/s and 1000 Mbit/s. The Ethernet system uses point-to-point communication that is connected via an Ethernet switch [Module <--> Switch <--> Module]. The Ethernet bus does not use terminating resistors.

The K56 Serial Data Gateway Module and the A11 Radio have an Ethernet switch that connects to other Ethernet modules. The K56 Serial Data Gateway Module and the A11 Radio communicate with other devices and systems in the vehicle via CAN and LIN buses. Diagnostic Trouble Codes will be read on CAN to diagnose Ethernet, LIN and system faults.

Note: Ethernet harness failures should only be repaired using an appropriate kit to perform de-pin/re-pin overlays or in cases where the wiring harness repair kits are not available, the entire harness should be replaced. No crimps or splicing should be performed on the Ethernet wiring harness.

Ethernet 1

Ethernet bus 1 consists of 2 twisted pair of wires [1 pair for Ethernet bus 1R (circuits 4972 & 4973) and 1 pair for Ethernet bus 1T (circuits 4974 & 4975)]. It is connected between X84 Data Link Connector (DLC) and K56 Serial Data Gateway Module. This bus is used for diagnostics and service programming of control modules using Ethernet instead of CAN. The K56 Serial Data Gateway Module will convert Ethernet serial data to CAN as necessary, and vice versa. There is an Ethernet enable circuit (circuit 7207) which can be used to wake up the K56 Serial Data Gateway Module for Ethernet diagnostic and programming.

Ethernet 2

Ethernet bus 2 (circuits 4757 & 4758) is for connection between the A11 Radio and the K56 Serial Data Gateway Module.

Ethernet 3

Ethernet bus 3 (circuits 7208 & 7209) is for connection between the following control modules depending on vehicle configuration:

- K56 Serial Data Gateway Module and K179 Automated Driving Mapping Module.
- K56 Serial Data Gateway Module and K124 Image Processing Module.
- K56 Serial Data Gateway Module and B174W Front View Camera - Windshield.

Ethernet 4

Ethernet bus 4 (circuits 7210 & 7211) is for connection between the following control modules:

- K56 Serial Data Gateway Module and K73 Telematic Control Module for vehicles equipped with IOR radio.
- A11 Radio and K73 Telematic Control Module for vehicles equipped with other radios.

Ethernet 5

Ethernet bus 5 (circuits 7212 & 7213) is for connection between the A11 Radio and P22F Video Display - Right Front Seat Back.

Ethernet 6

Ethernet bus 6 (circuits 7214 & 7215) is for connection between the A11 Radio and T3 Audio Amplifier.

Ethernet 7

Ethernet bus 7 (circuits 7216 & 7217) is for connection between the K56 Serial Data Gateway Module and P16 Instrument Panel Cluster Control Module or K190 Off-Board Charger Control Module.

Ethernet 11

Ethernet bus 11 (circuits 7224 & 7225) is for connection between the K124 Image Processing Module and K179 Automated Driving Mapping Module.

Ethernet 14

Ethernet bus 14 (circuits 7230 & 7231) is for connection between the A11 Radio and P29 Head-Up Display.

Ethernet 15

Ethernet bus 15 (circuits 7232 & 7233) is for connection between the K56 Serial Data Gateway Module, K161 Vehicle Performance Data Recorder, and P22F Video Display - Passenger Seat Back.

X84 Data Link Connector (DLC)

The X84 Data Link Connector is a standardized 16-cavity connector. Connector design and location is dictated by an industry wide standard, and is required to provide the following:

- Terminal 1: CAN Bus 7 Serial Data [+]
- Terminal 2: Private Presentation CAN Bus 1 Serial Data [+]
- Terminal 3: Ethernet Bus 1R [+]
- Terminal 4: Scan tool power ground
- Terminal 5: Common signal ground
- Terminal 6: CAN Bus 6 Serial Data [+]
- Terminal 7: Private Presentation CAN Bus 2 Serial Data [+]
- Terminal 8: Ethernet Bus 1 Enable Signal
- Terminal 9: CAN Bus 7 Serial Data [-]
- Terminal 10: Private Presentation CAN Bus 1 Serial Data [-]
- Terminal 11: Ethernet Bus 1R [-]
- Terminal 12: Ethernet Bus 1T [+]
- Terminal 13: Ethernet Bus 1T [-]
- Terminal 14: CAN Bus 6 Serial Data [-]
- Terminal 15: Private Presentation CAN Bus 2 Serial Data [-]
- Terminal 16: Scan tool power, B+

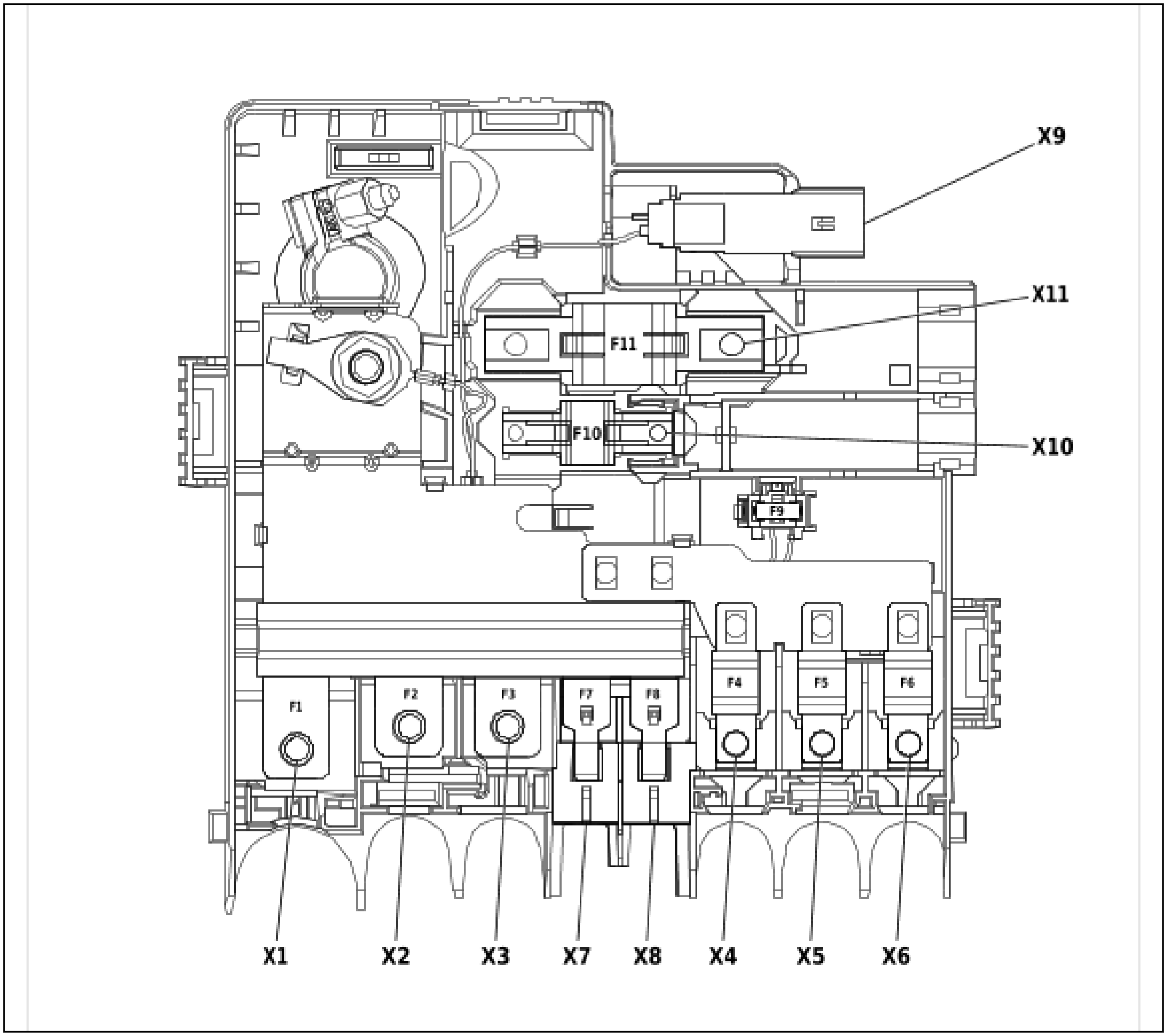
Serial Data Reference

The scan tool communicates over the various buses on the vehicle. When a scan tool is installed on a vehicle, the scan tool will try to communicate with every control module that could be optioned into the vehicle. If an option is not installed on the vehicle, the scan tool will display No Communication for that optional control module. In order to avert misdiagnoses of No Communication with a specific control module, refer to [Link target (target-id 148085-) not found] for a list of control modules and the buses they communicate with. Use schematics and specific vehicle build RPO codes to determine optional control modules.

Electrical Component and Inline Harness Connector End Views

Component Locator

X50B Battery Distribution Engine Compartment Fuse Block Top View


X9
X11
F11
F10
X10
F9
F1
F2
F3
F7
F8
F4
F5
F6
X1
X2
X3
X7
X8
X4
X5
X6

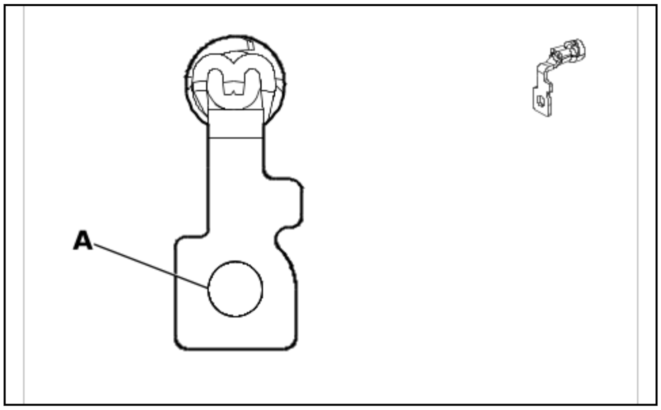
5070128

Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Fuses				
F1	—	F1BA	250A	• G13 Generator • X50A Engine Wiring Harness Junction Block

No.	Device Label Name	Device Assigned Name	Rating	Description
F2	—	F2BA	175A (L8T) 400A (L5P)	• X50A Engine Wiring Harness Junction Block (L8T) • G13 Generator (L8T) • X50EA Battery Distribution Fuse Block - Auxiliary (L5P) • X50A Engine Wiring Harness Junction Block (L5P)
F3	—	F3BA	400A	• M64 Starter Motor
F4	—	F4BA	60A	• E40 Air Heater (C32)
F5	—	F5BA	100A (K4Z) 60A (L5P)	• X50EA Battery Distribution Fuse Block - Auxiliary (K4Z) • K20 Engine Control Module (L5P)
F6	—	F6BA	60A	• K20 Engine Control Module (L5P)
F7	—	F7BA	60A	• X51R Instrument Panel Wiring Harness Junction Block - Right
F8	—	F8BA	60A	• X51R Instrument Panel Wiring Harness Junction Block - Right
F9	—	F9BA	5A	• B110 Battery Sensor Module
F10	—	F10BA	60A	• X51AX Instrument Panel Wiring Harness Junction Block - Right (9L7)

X50B Battery Distribution Engine Compartment Fuse Block X1



5881464

Connector Part Information

- Harness Type: Generator Battery Jumper Cable
- OEM Connector: 84335252
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

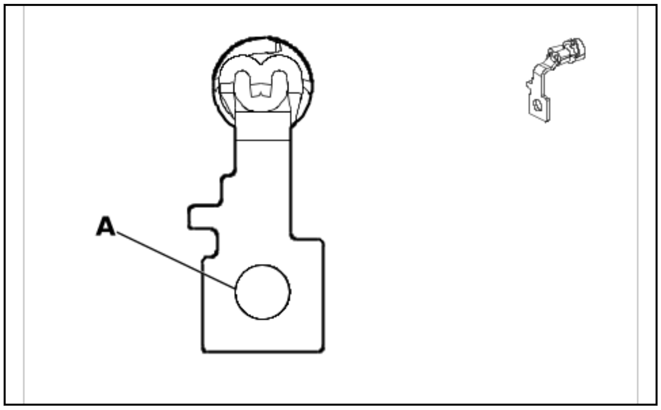
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	35	RD / GN	242	Battery Positive Voltage	I	—
	35	RD / YE	2	Battery Positive Voltage		L5P
	35	RD / YE	2	Battery Positive Voltage		L8T

X50B Battery Distribution Engine Compartment Fuse Block X2 (L5P)



5664311

Connector Part Information
- Harness Type: Battery Positive Cable
- OEM Connector: 84392526
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

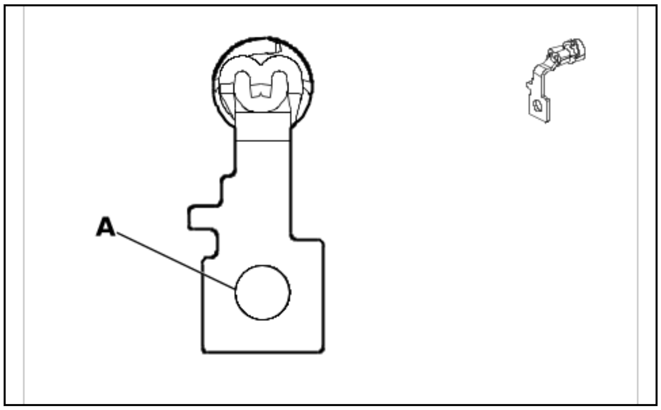
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X2 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	35	RD / GN	242	Battery Positive Voltage	I	L5P

X50B Battery Distribution Engine Compartment Fuse Block X2 (L8T)



5664311

Connector Part Information
- Harness Type: Battery Positive Cable
- OEM Connector: 84386514
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

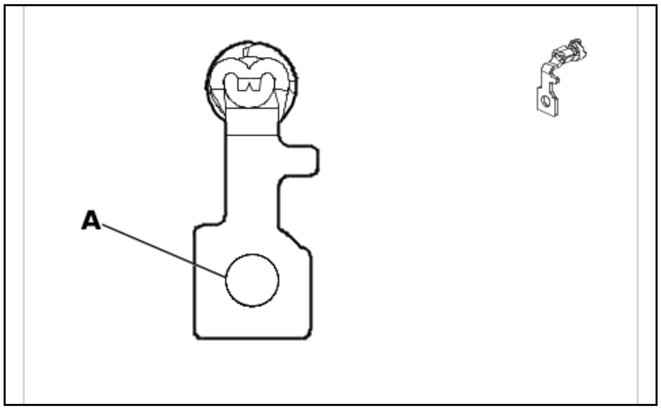
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X2 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / GN	242	Battery Positive Voltage	I	KHF+ L8T
	25	RD / GN	242	Battery Positive Voltage	I	L8T- KHF

X50B Battery Distribution Engine Compartment Fuse Block X3



5881244

Connector Part Information
- Harness Type: Starter Solenoid Cable
- OEM Connector: 84386515
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

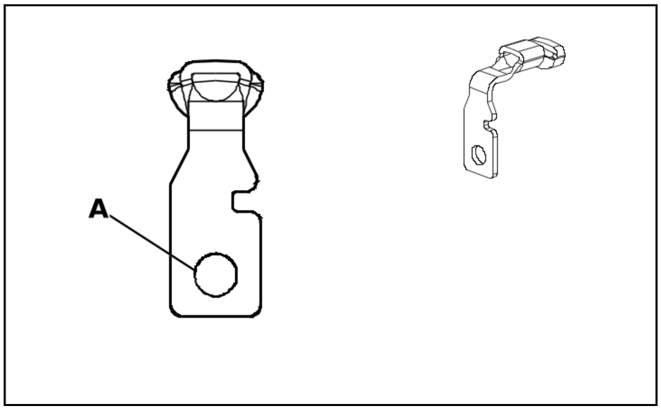
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	35 35	RD / YE RD / YE	2 2	Battery Positive Voltage Battery Positive Voltage	I I	L5P L8T

X50B Battery Distribution Engine Compartment Fuse Block X4



5194789

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35085117
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

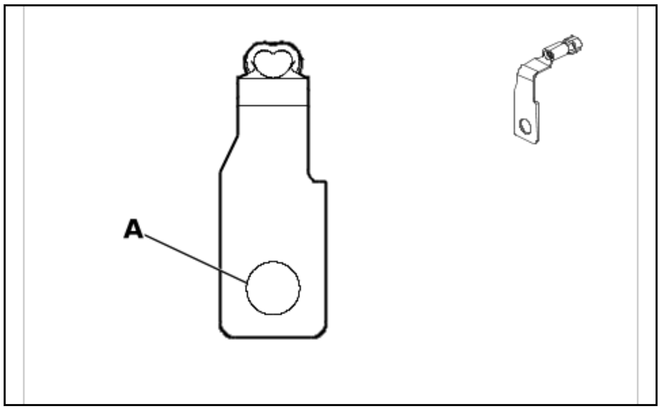
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	10	RD / GY	642	Battery Positive Voltage	I	—

X50B Battery Distribution Engine Compartment Fuse Block X5 (L5P)



5373306

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 84472882
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

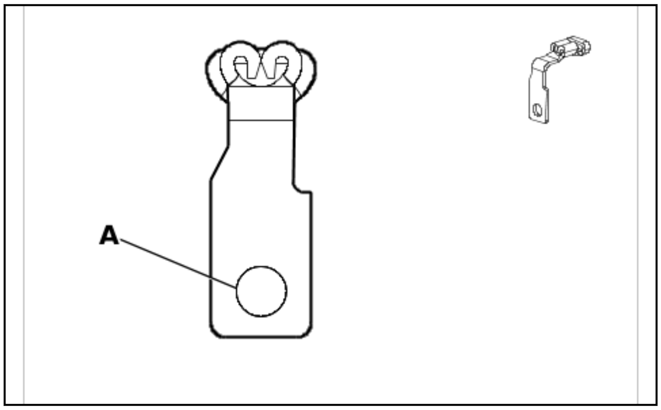
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X5 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	6	BN / BU	104	Glow Plug Control	I	—

X50B Battery Distribution Engine Compartment Fuse Block X5 (L8T)



5838179

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 84386517
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

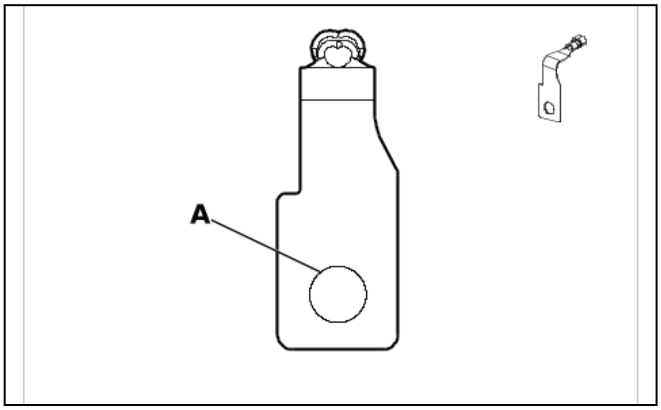
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X5 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	16	RD / GN	742	Battery Positive Voltage	I	K4Z

X50B Battery Distribution Engine Compartment Fuse Block X6



6167349

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 84392525
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

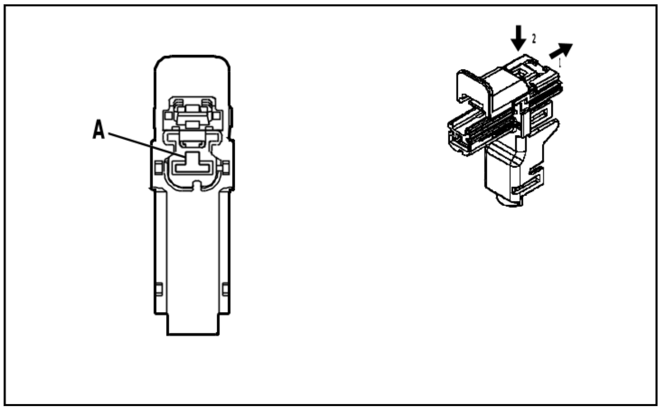
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X6

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	6	BN / BU	104	Glow Plug Control	I	—

X50B Battery Distribution Engine Compartment Fuse Block X7



4994171

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 33297579
- Service Connector: Service by Harness - See Part Catalog
- Description: 1-Way F 6.3 Series(BU)

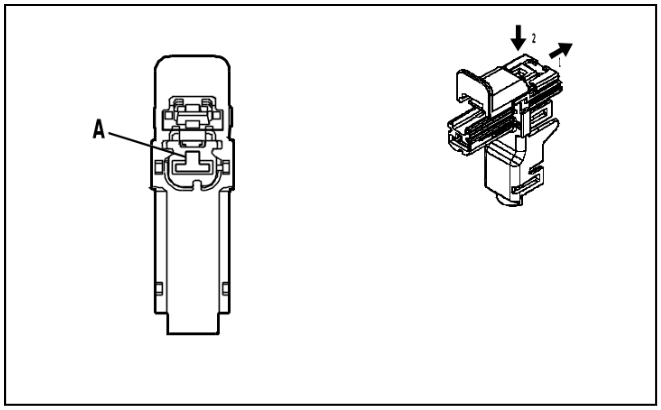
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X7

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	5	RD / YE	1442	Battery Positive Voltage	I	—

X50B Battery Distribution Engine Compartment Fuse Block X8



4994183

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 33297578
- Service Connector: Service by Harness - See Part Catalog
- Description: 1-Way F 6.3 Series(BK)

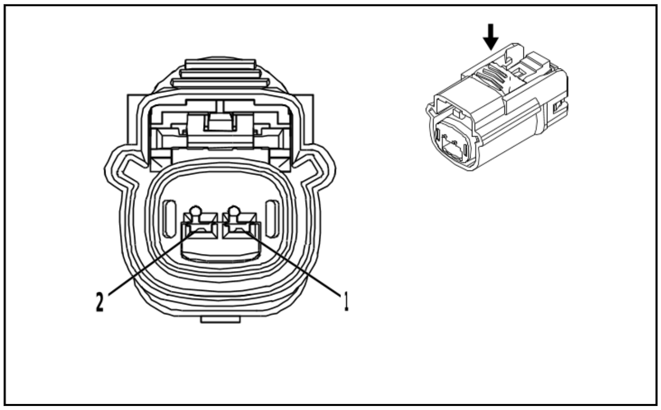
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X8

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	10	RD / WH	342	Battery Positive Voltage	I	—

X50B Battery Distribution Engine Compartment Fuse Block X9



4332222

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 33314786
- Service Connector: 19368124
- Description: 2-Way F 1.5 OCS Series, Sealed(BK)

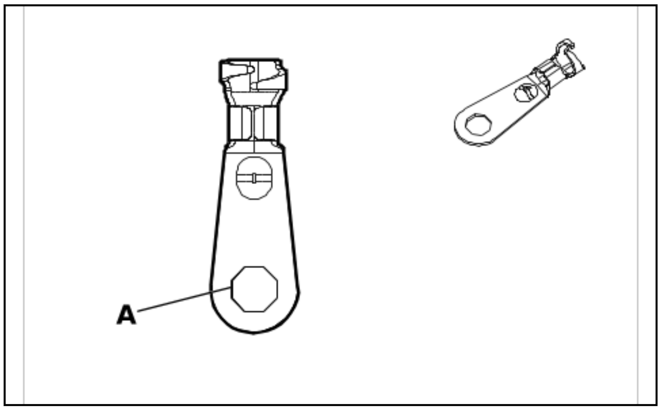
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X9

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) RD / YE	(1) 2340	(1) Battery Positive Voltage	(1) I	(1) —
2	—	—	—	Not Occupied	—	—

X50B Battery Distribution Engine Compartment Fuse Block X10



5920578

Connector Part Information

- Harness Type: Battery Positive Cable Extension Cable
- OEM Connector: 13624367
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

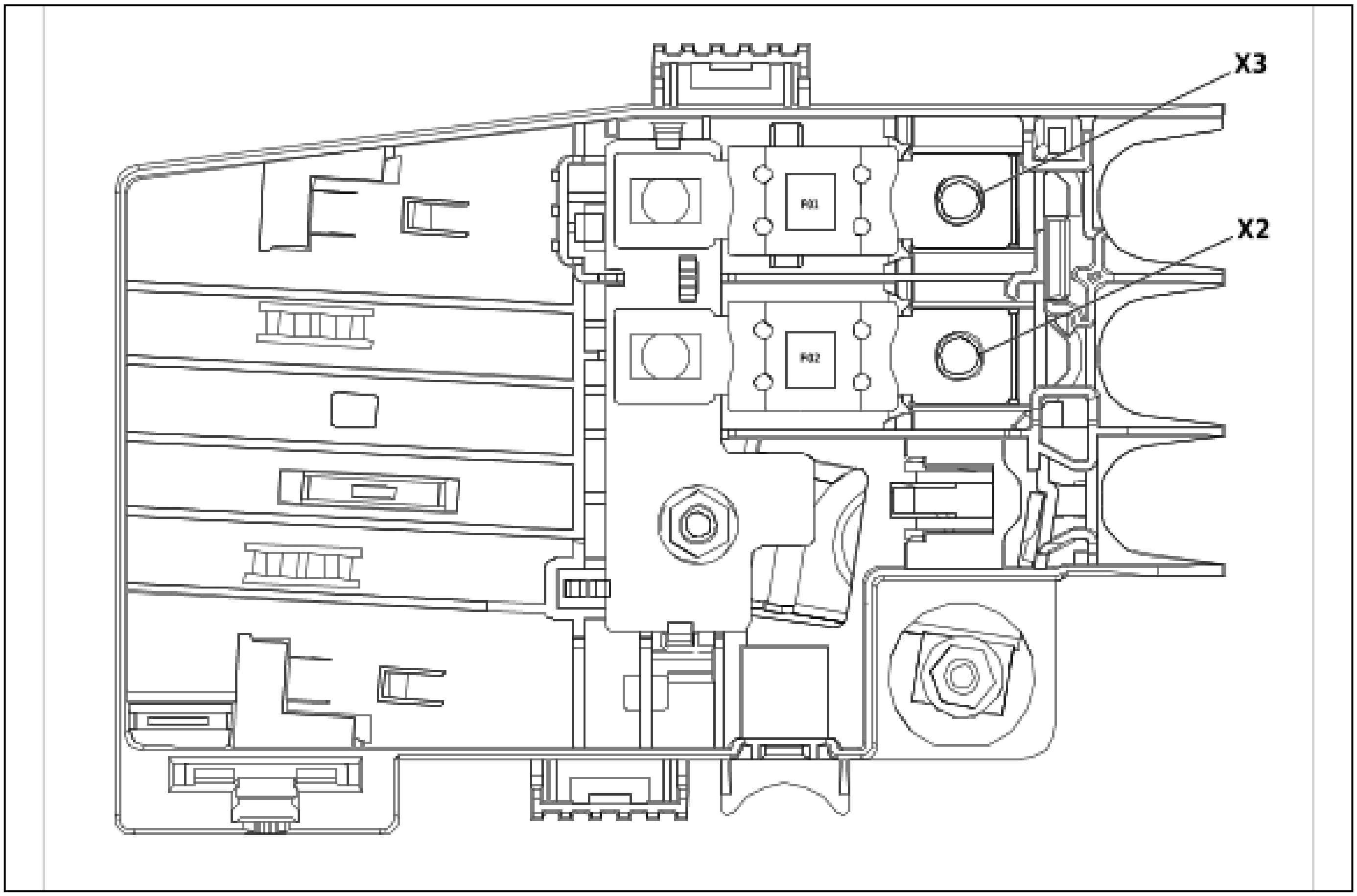
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50B Battery Distribution Engine Compartment Fuse Block X10

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	10	RD / VT	542	Battery Positive Voltage	I	—

X50EA Battery Distribution Fuse Block - Auxiliary Top View (L5P)

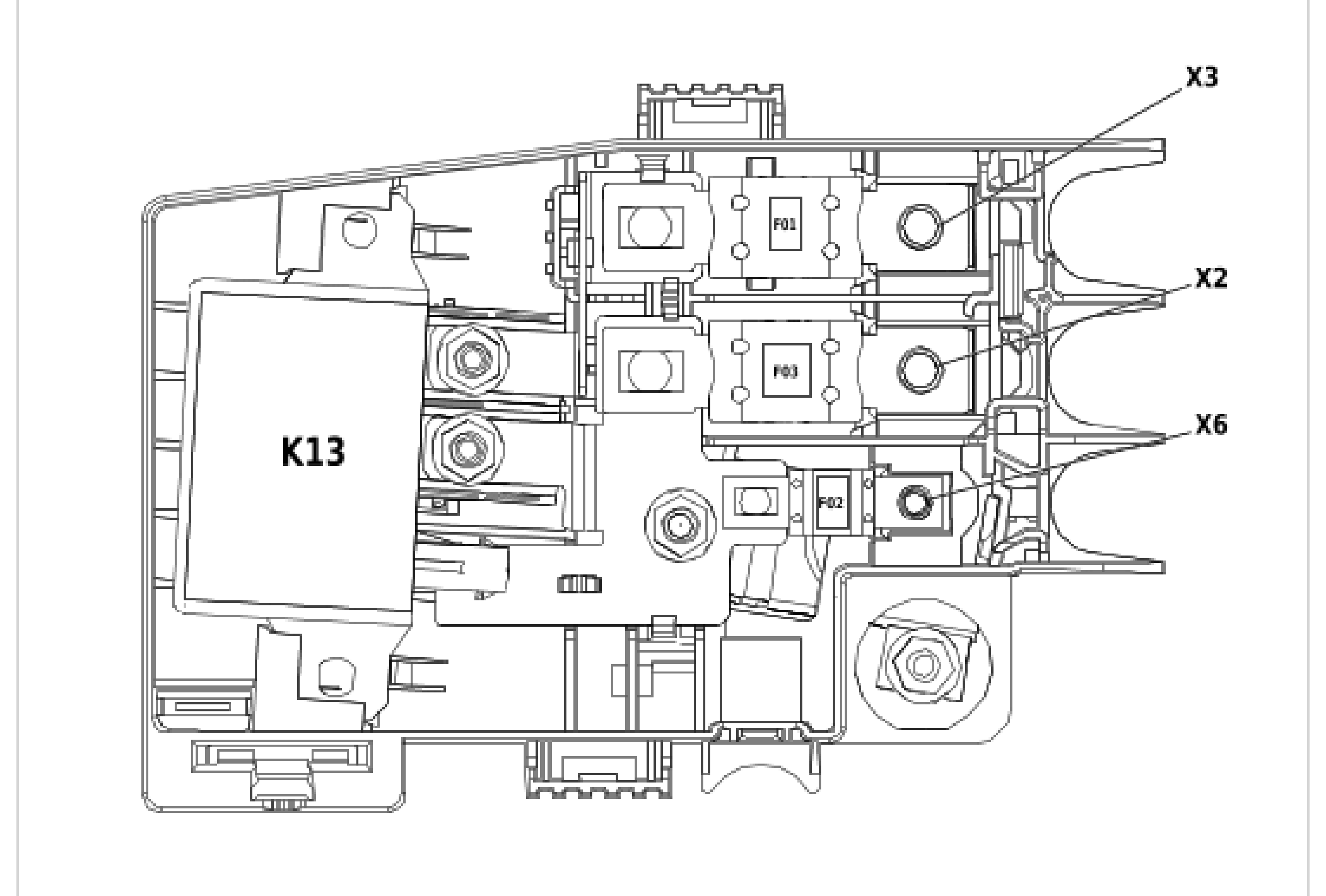


6465525

Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Fuses				
F1	—	F1BB	175A	• G13A Auxiliary Generator
F2	—	F2BB	400A	• X50A Engine Wiring Harness Junction Block • X50B Battery Distribution Engine Compartment Fuse Block
F3	—	F3BB	30A	• Not Used

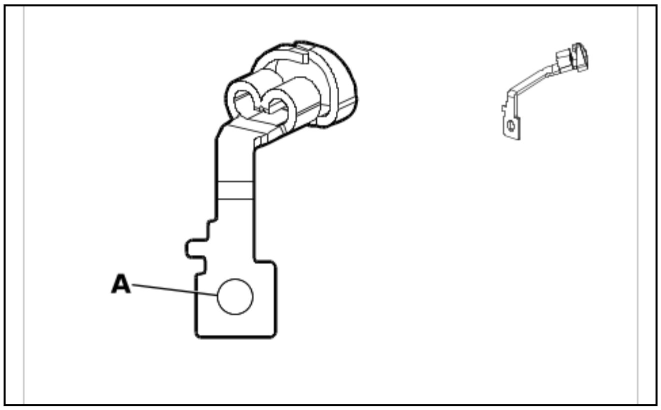
X50EA Battery Distribution Fuse Block - Auxiliary Top View (L8T & K4Z)



Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Fuses				
F1	—	F1BB	100A	• X50B Battery Distribution Engine Compartment Fuse Block
F2	—	F2BB	30A	• X88B Tow Vehicle Electrical Receptacle
F3	—	F3BB	175A	• Not Used
Relays				
K13	—	KR81B Auxiliary Battery Relay 2	—	• F1BB

X50EA Battery Distribution Fuse Block - Auxiliary X2



6444120

Connector Part Information
- Harness Type: Battery Positive Cable
- OEM Connector: 84668601
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

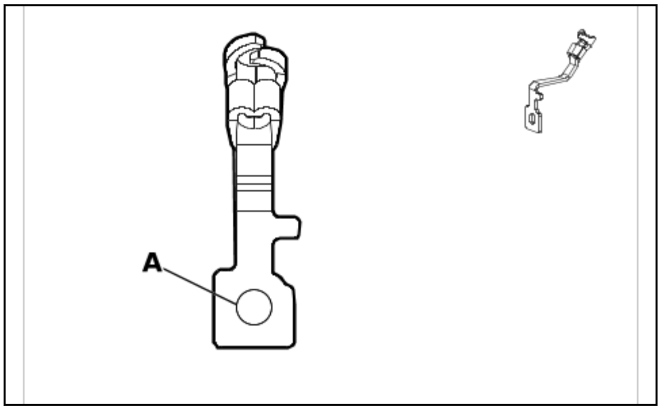
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50EA Battery Distribution Fuse Block - Auxiliary X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / YE	2	Battery Positive Voltage	I	L5P
	35	RD / GN	242	Battery Positive Voltage	I	L5P

X50EA Battery Distribution Fuse Block - Auxiliary X3 (L5P)



6444793

Connector Part Information
- Harness Type: Auxiliary Generator Battery Jumper Cable
- OEM Connector: 84537524
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

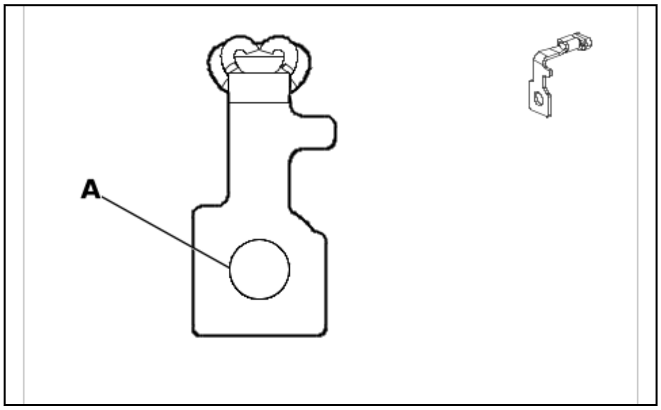
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50EA Battery Distribution Fuse Block - Auxiliary X3 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / YE	2	Battery Positive Voltage	I	KHF+ L5P

X50EA Battery Distribution Fuse Block - Auxiliary X3 (L8T)



5873864

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 84537527
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

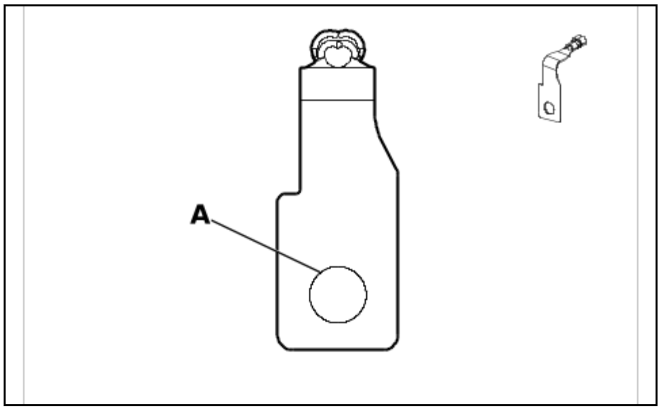
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50EA Battery Distribution Fuse Block - Auxiliary X3 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	16	RD / GN	742	Battery Positive Voltage	I	K4Z

X50EA Battery Distribution Fuse Block - Auxiliary X6



6167349

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 84392525
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

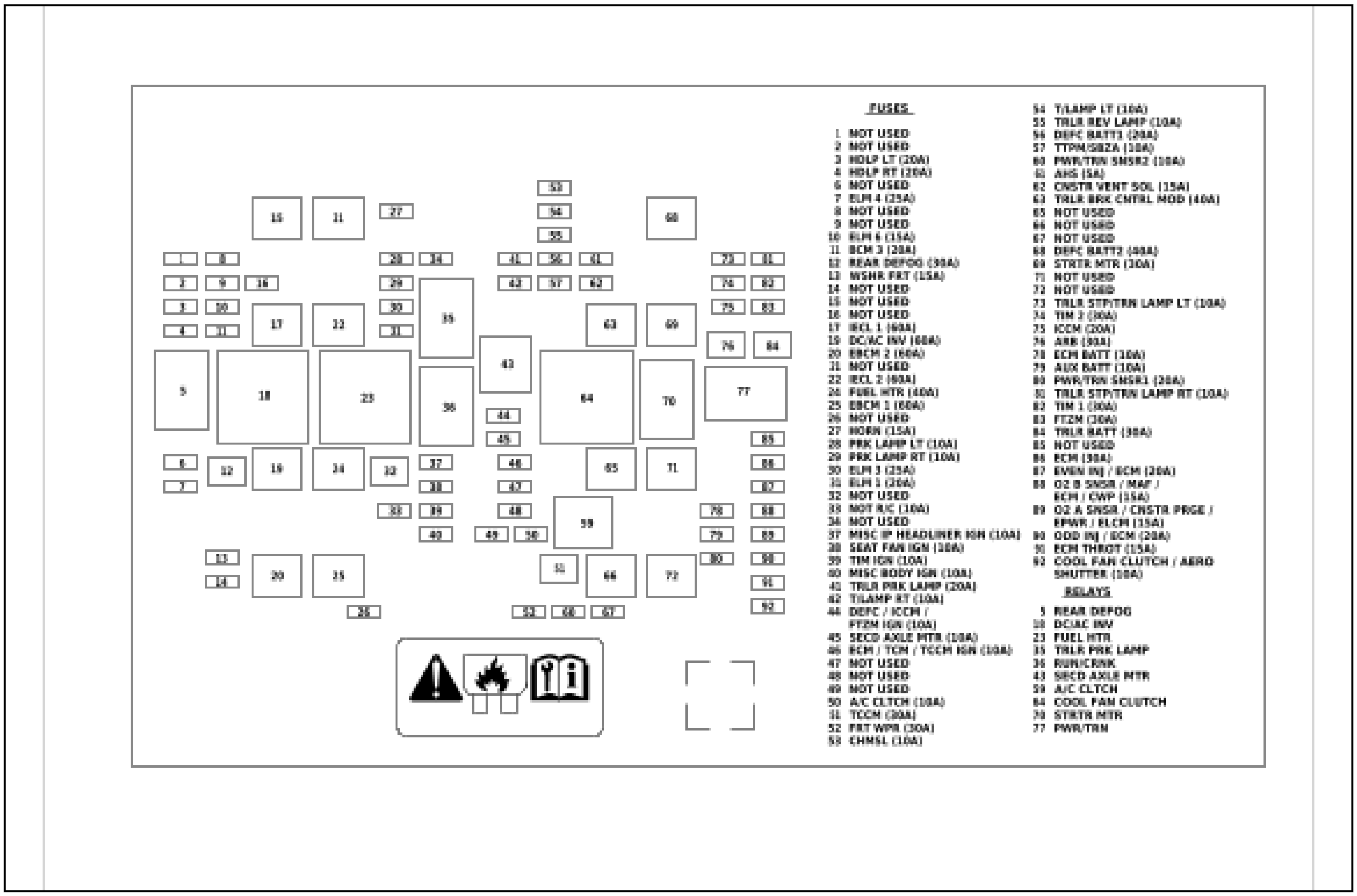
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50EA Battery Distribution Fuse Block - Auxiliary X6

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	4	RD / GN	842	Battery Positive Voltage	I	K4Z

X50A Engine Wiring Harness Junction Block Label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FUSES

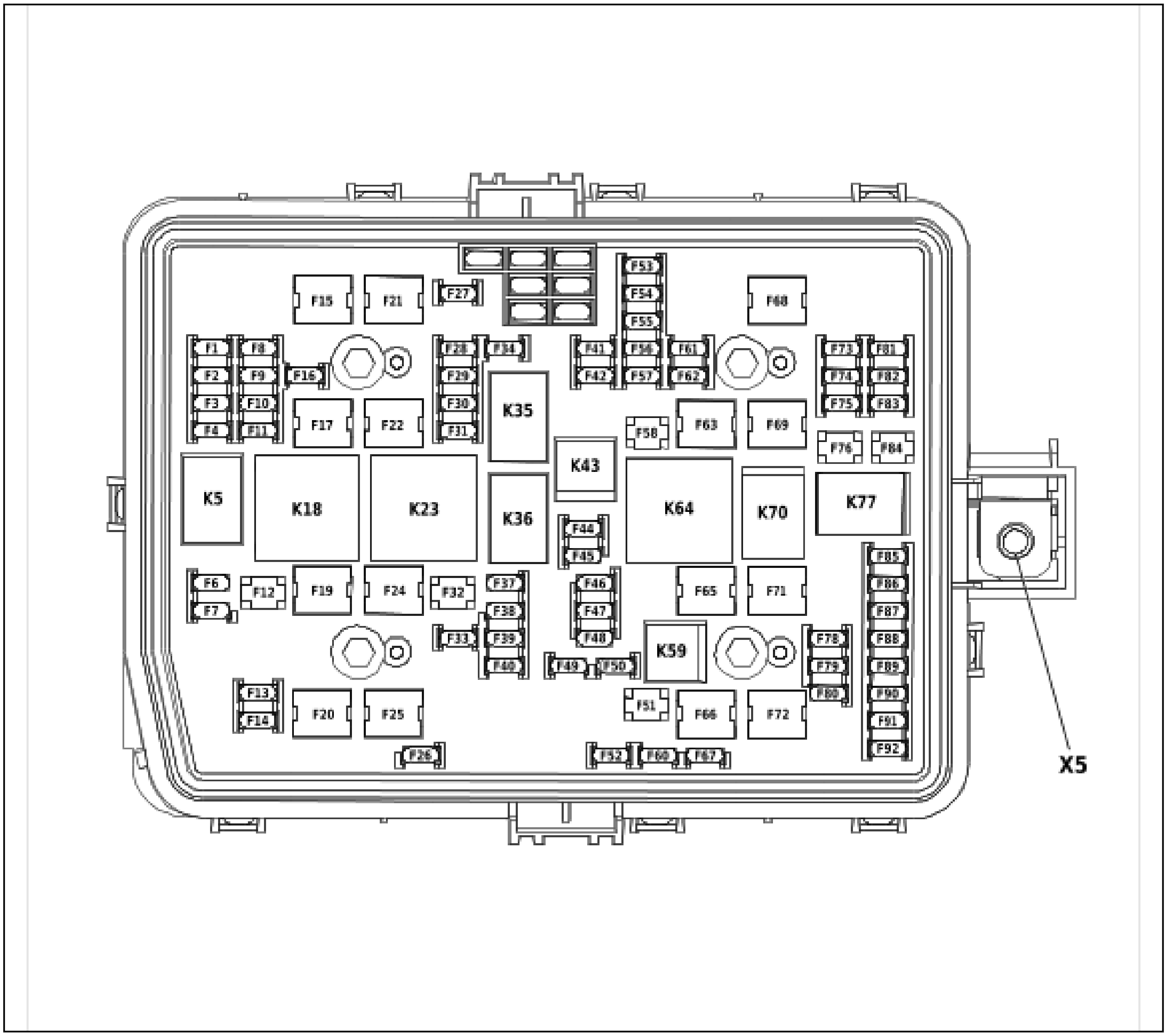
1	NOT USED
2	NOT USED
3	HDLP LT (20A)
4	HDLP RT (20A)
6	NOT USED
7	ELM 4 (25A)
8	NOT USED
9	NOT USED
10	ELM 6 (15A)
11	BCM 3 (20A)
12	REAR DEFOG (30A)
13	WSHR FRT (15A)
14	NOT USED
15	NOT USED
16	NOT USED
17	IECL 1 (60A)
19	DC/AC INV (60A)
20	EBCM 2 (60A)
21	NOT USED
22	IECL 2 (60A)
24	FUEL HTR (40A)
25	EBCM 1 (60A)
26	NOT USED
27	HORN (15A)
28	PRK LAMP LT (10A)
29	PRK LAMP RT (10A)
30	ELM 3 (25A)
31	ELM 1 (20A)
32	NOT USED
33	NOT R/C (10A)
34	NOT USED
37	MISC IP HEADLINER IGN (10A)
38	SEAT FAN IGN (10A)
39	TIM IGN (10A)
40	MISC BODY IGN (10A)
41	TRLR PRK LAMP (20A)
42	T/LAMP RT (10A)
44	DEFC / ICCM / FTZM IGN (10A)
45	SECD AXLE MTR (10A)
46	ECM / TCM / TCCM IGN (10A)
47	NOT USED
48	NOT USED
49	NOT USED
50	A/C CLTCH (10A)
51	TCCM (30A)
52	FRT WPR (30A)
53	CHMSL (10A)
54	T/LAMP LT (10A)
55	TRLR REV LAMP (10A)
56	DEFC BATT1 (20A)
57	TTPM/SBZA (10A)
60	PWR/TRN SNSR2 (10A)
61	AHS (5A)
62	CNSTR VENT SOL (15A)
63	TRLR BRK CNTRL MOD (40A)
65	NOT USED
66	NOT USED
67	NOT USED
68	DEFC BATT2 (40A)
69	STRTR MTR (30A)
71	NOT USED
72	NOT USED
73	TRLR STP/TRN LAMP LT (10A)
74	TIM 2 (30A)
75	ICCM (20A)
76	ARB (30A)
78	ECM BATT (10A)
79	AUX BATT (10A)
80	PWR/TRN SNSR1 (20A)
81	TRLR STP/TRN LAMP RT (10A)
82	TIM 1 (30A)
83	FTZM (20A)
84	TRLR BATT (30A)
85	NOT USED
86	ECM (30A)
87	EVEN INJ / ECM (20A)
88	O2 B SNSR / MAF / ECM / CWP (15A)
89	O2 A SNSR / CNSTR PRGE / EPWR / ELCM (15A)
90	ODD INJ / ECM (20A)
91	ECM THROT (15A)
92	COOL FAN CLUTCH / AERO SHUTTER (10A)

RELAYS

5	REAR DEFOG
18	DC/AC INV
23	FUEL HTR
35	TRLR PRK LAMP
36	RUN/CRNK
43	SECD AXLE MTR
59	A/C CLTCH
64	COOL FAN CLUTCH
70	STRTR MTR
77	PWR/TRN

6401221

X50A Engine Wiring Harness Junction Block Top View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X5

6485542

Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Fuses				
F1	NOT USED	F1UA	—	• Not Used
F2	NOT USED	F2UA	—	• Not Used
F3	HDLP LT	F3UA	20A	• E13LA Front Headlamp - Left
F4	HDLP RT	F4UA	20A	• E13RA Front Headlamp - Right
F6	ELM 7	F6UA	25A	• Not Used
F7	ELM 4	F7UA	25A	• K219 Lighting Control Module
F8	NOT USED	F8UA	—	• Not Used
F9	ELM 5	F9UA	25A	• Not Used

No.	Device Label Name	Device Assigned Name	Rating	Description
F10	ELM 6	F10UA	15A	• K219 Lighting Control Module
F11	BCM 2	F11UA	20A	• K9 Body Control Module
F12	REAR DEFOG	F12UA	30A	• E18 Rear Window Defogger Grid
F13	WSHR FRT	F13UA	15A	• G24 Windshield Washer Pump
F14	NOT USED	F14UA	—	• Not Used
F15	NOT USED	F15UA	—	• Not Used
F16	NOT USED	F16UA	—	• Not Used
F17	IECL 1	F17UA	60A	• X53AF Body Wiring Harness Junction Block
F19	DC/AC INV	F19UA	60A	• T1 DC/AC Converter Control Module (KI4/KI5)
F20	IECR2	F20UA	60A	• K160 Brake System Control Module
F21	NOT USED	F21UA	—	• Not Used
F22	IECL 2	F22UA	60A	• X53AF Body Wiring Harness Junction Block
F24	FUEL HTR	F24UA	40A	• R29 Fuel Filter (L5P)
F25	EBCM	F25UA	60A	• K160 Brake System Control Module
F26	NOT USED	F26UA	—	• Not Used
F27	HORN	F27UA	15A	• P13 Horn
F28	PARK LAMP LT	F28UA	10A	• A9A Outside Rearview Mirror - Driver (DBG/DWI/DZC) • A9B Outside Rearview Mirror - Passenger (DBG/DWI/DZC) • E3A Front Clearance Lamp - Roof Left Outer • E3FA Front Identification Lamp • E3E Front Clearance Lamp - Roof Right Outer • E3LF Rear Clearance Lamp - Fender Left Front • E3LR Rear Clearance Lamp - Fender Left Rear • E3RF Rear Clearance Lamp - Fender Right Front • E3RR Rear Clearance Lamp - Fender Right Rear • E3RA Rear Identification Lamp • E3LRW Rear Side Marker Lamp - Left Wheel Opening Molding • E3RRW Rear Side Marker Lamp - Right Wheel Opening Molding
F29	PARK LAMP RT	F29UA	10A	• Not Used
F30	ELM 3	F30UA	25A	• K219 Lighting Control Module
F31	ELM 1	F31UA	20A	• K219 Lighting Control Module
F32	NOT USED	F32UA	—	• Not Used
F33	NOT R/C	F33UA	10A	• K60 Column Lock Module
F34	RADARS	F34UA	10A	• Not Used
F37	MISC IP HEADLINER IGN	F37UA	10A	• A10 Inside Rearview Mirror • E40 Air Heater (C32) • P16 Instrument Panel Cluster Control Module • P43 Forward Collision Alert Display ((UEU/UHX)-UV6) • B87CA Auxiliary Rearview Camera - Cargo Area (UVO)

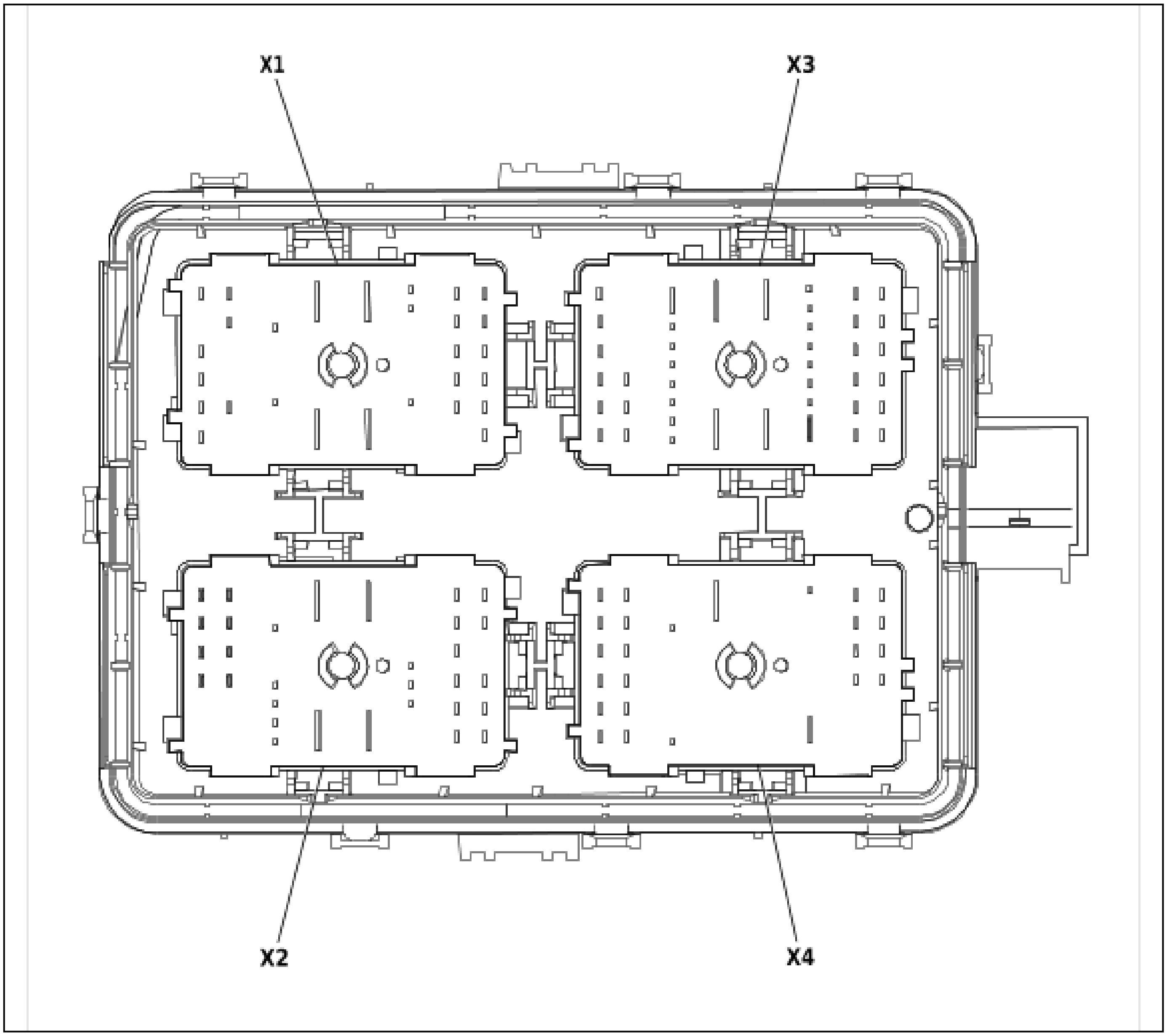
No.	Device Label Name	Device Assigned Name	Rating	Description
F38	SEAT FAN IGN	F38UA	10A	• M73A Front Seat Back Ventilation Blower - Driver (KQV) • M73B Front Seat Back Ventilation Blower - Passenger (KQV) • M73D Front Seat Cushion Ventilation Blower - Driver (KQV) • M73P Front Seat Cushion Ventilation Blower - Passenger (KQV)
F39	NOT USED	F39UA	10A	• K68 Trailer Lamp Control Module (UET)
F40	MISC BODY IGN	F40UA	10A	• K36 Restraints Control Module • K17 Electronic Brake Control Module • K219 Lighting Control Module • T1 DC/AC Converter Control Module (KI4/KI5)
F41	TRLR PRK LAMP / GRT GRILLE LAMP	F41UA	20A	• X88B Tow Vehicle Electrical Receptacle (Z82-UET)
F42	T/LAMP RT	F42UA	10A	• E42R Rear Body Structure Stop Lamp - Right
F44	DEFC / ICCM / FTZM IGN	F44UA	10A	• K38 Chassis Control Module (G94) • K111 Fuel Pump Power Control Module • K115 Reductant Control Module (L5P)
F45	SECD AXLE MTR	F45UA	10A	• Not Used
F46	ECM / TCM / TCCM IGN	F46UA	15A	• K20 Engine Control Module • K71 Transmission Control Module • K69 Transfer Case Control Module
F47	NOT USED	F47UA	—	• Not Used
F48	NOT USED	F48UA	—	• Not Used
F49	TRANS AUX OIL PUMP	F49UA	15A	• Not Used
F50	A/C CLTCH	F50UA	10A	• Q2 Air Conditioning Clutch
F51	TCCM	F51UA	30A	• K69 Transfer Case Control Module (NP0/NQH)
F52	FRT WPR	F52UA	30A	• M75 Windshield Wiper Motor
F53	CHMSL	F53UA	10A	• E6A High Mount Stop and Cargo Lamp (Regular Cab)
F54	T/LAMP LT	F54UA	10A	• E42L Rear Body Structure Stop Lamp - Left
F55	TRLR REV LAMP	F55UA	10A	• X88B Tow Vehicle Electrical Receptacle (Z82-UET)
F56	DEFC BATT1	F56UA	20A	• K115 Reductant Control Module (L5P)
F57	TTPM/SBZA	F57UA	10A	• B218L Side Obstacle Detection Control Module - Left (UKC/UKV) • B218R Side Obstacle Detection Control Module - Right (UKC/UKV) • K214 Trailer Tire Pressure Indicator Module (UET)
F58	STRTR MTR	F58UA	30A	• Not Used
F60	PWR/TRN SNSR2	F60UA	10A	• B195A Nitrogen Oxides Sensor 1 (L5P) • K44 Power Takeoff Control Module (PTO)
F61	AHS	F61UA	5A	• K43 Power Steering Control Module (NV8)
F62	CNSTR VENT SOL	F62UA	15A	• Q13 Evaporative Emission Canister Vent Solenoid Valve (L8T)

No.	Device Label Name	Device Assigned Name	Rating	Description
F63	TRLR BRK CNTRL MOD	F63UA	40A	• K67 Trailer Brake Control Module (JL1) • W24 Blunt Cut - Trailer Brakes Provision (JL1+Z82)
F65	NOT USED	F65UA	—	• Not Used
F66	COOL FAN MTR LT	F66UA	50A	• Not Used
F67	NOT USED	F67UA	—	• Not Used
F68	DEFC BATT2	F68UA	40A	• K115 Reductant Control Module (L5P)
F69	STRTR PINION	F69UA	40A	• M64 Starter Motor
F71	COOL FAN MTR LWR	F71UA	50A	• Not Used
F72	COOL FAN MTR RT	F72UA	50A	• Not Used
F73	TRLR STP/TRN LAMP LT	F73UA	10A	• X88B Tow Vehicle Electrical Receptacle (Z82-UET)
F74	TIM 2	F74UA	30A	• K68 Trailer Lamp Control Module (UET)
F75	NOT USED	F75UA	20A	• K38 Chassis Control Module (G94)
F76	ARB	F76UA	30A	• K4 Running Board Control Module (BRS)
F78	ECM BATT	F78UA	15A	• K20 Engine Control Module
F79	AUX BATT	F79UA	10A	• X50EA Battery Distribution Fuse Block - Auxiliary
F80	PWR/TRN SNSR1	F80UA	20A	• B195B Nitrogen Oxides Sensor 2 (L5P) • M103 Turbocharger Vane Position Actuator (L5P) • B136 Exhaust Particulate Matter Sensor (L5P) • K111 Fuel Pump Power Control Module (L5P) • R29 Fuel Filter (L5P)
F81	TRLR STP/TRN LAMP RT	F81UA	10A	• X88B Tow Vehicle Electrical Receptacle (Z82-UET)
F82	TIM 1	F82UA	30A	• K68 Trailer Lamp Control Module (UET)
F83	FTZM	F83UA	30A	• K111 Fuel Pump Power Control Module
F84	TRLR BATT	F84UA	30A	• X88B Tow Vehicle Electrical Receptacle (Z82)
F85	NOT USED	F85UA	—	• Not Used
F86	ECM	F86UA	30A	• K20 Engine Control Module
F87	EVEN INJ / ECM	F87UA	20A	• K20 Engine Control Module (L8T) • T8B Ignition Coil 2 (L8T) • T8D Ignition Coil 4 (L8T) • T8F Ignition Coil 6 (L8T) • T8H Ignition Coil 8 (L8T)
F88	O2 B SNSR / MAF / ECM / EVAP / CWP / BCV	F88UA	15A	• B75 Mass Airflow Sensor • B52D Heated Oxygen Sensor - Bank 1 Sensor 2 (L8T) • B52F Heated Oxygen Sensor - Bank 2 Sensor 2 (L8T) • K20 Engine Control Module • M10 Charge Air Cooler Coolant Pump (L5P)

No.	Device Label Name	Device Assigned Name	Rating	Description
F89	O2 A SNSR / CNSTR PRGE / EPWR / WRAF / TURBO BYPASS / STEP CAM	F89UA	15A	• B52C Heated Oxygen Sensor - Bank 1 Sensor 1 (L8T) • B52E Heated Oxygen Sensor - Bank 2 Sensor 1 (L8T) • Q12 Evaporative Emission Canister Purge Solenoid Valve (L8T) • G34 Evaporative Emission System Leak Detection Pump (L8T) • Q44 Engine Oil Pressure Control Solenoid Vlave (L8T)
F90	ODD INJ / ECM	F90UA	20A	• K20 Engine Control Module (L8T) • T8A Ignition Coil 1 (L8T) • T8C Ignition Coil 3 (L8T) • T8E Ignition Coil 5 (L8T) • T8G Ignition Coil 7 (L8T)
F91	NOT USED	F91UA	15A	• K20 Engine Control Module
F92	AERO SHUTTER	F92UA	10A	• M96A Active Grille Air Shutter Actuator 1 (VTI) • Q85 Cooling Fan Clutch (L5P)
Relays				
K5	REAR DEFOG	KR5 Rear Window Defogger Relay	—	• F12UA
K18	DC/AC INV	KR202 Accessory AC and DC Power Control Module Relay	—	• F19UA
K23	FUEL HTR	KR22 Fuel Heater Relay	—	• R29 Fuel Filter (L5P)
K35	TRLR PRK LAMP/FRT GRILLE LAMP	KR53 Parking Lamp Relay	—	• F28UA • F41UA
K36	RUN/CRNK	KR73 Ignition Main Relay	—	• F33UA • F37UA • F38UA • F39UA • F40UA • F44UA • F46UA
K43	SECD AXLE MTR	KR203 Front Drive Axle Actuator Relay	—	• M26 Front Drive Axle Actuator
K59	A/C CLTCH	KR29 A/C Compressor Clutch Relay	—	• F50UA
K64	COOL FAN CLUTCH	KR20F Cooling Fan Relay	—	• Q85 Cooling Fan Clutch
K70	STRTR MTR	KR27 Starter Motor	—	• M64 Starter Motor

No.	Device Label Name	Device Assigned Name	Rating	Description
K77	PWR/TRN	KR75 Engine Controls Ignition Relay	—	• F86UA • F87UA • F88UA • F89UA • F90UA • F91UA • F92UA • KR29 Air Conditioning Compressor Relay
Note: Relays listed below are non-serviceable Printed Circuit Board (PCB) relays and are internal to the block.				
—	—	KR3 Horn Relay	—	• F27UA
—	—	KR11 Windshield Washer Pump Relay	—	• G24 Windshield Washer Pump
—	—	KR12B Windshield Wiper Motor Relay	—	• M75 Windshield Wiper Motor
—	—	KR12C Windshield Wiper Motor Speed Control Relay	—	• M75 Windshield Wiper Motor
—	—	KR61 Trailer Backup Lamp Relay	—	• F53UA
—	—	KR63L Trailer Stop/Turn Signal Lamp Relay - Left	—	• F55UA
—	—	KR63R Trailer Stop/Turn Signal Lamp Relay - Right	—	• F73UA
—	—	KR200 Engine Controls Sensor Supply Voltage Relay	—	• F81UA
—	—	KR41 High Mount stop Lamp Relay	—	• F60UA • F80UA

X50A Engine Wiring Harness Junction Block Bottom View



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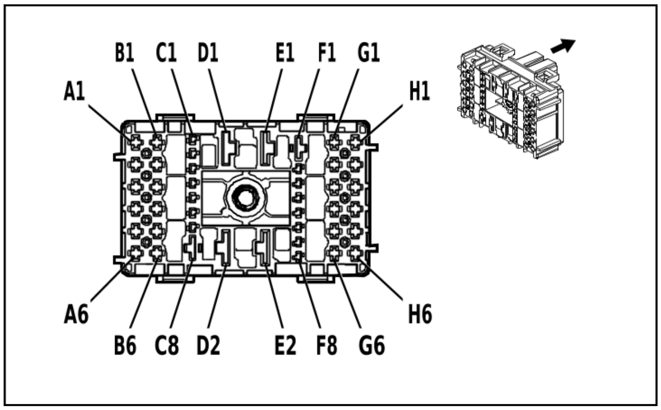
X50A Engine Wiring Harness Junction Block X1



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Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 33384590
- Service Connector: 19370824
- Description: 44-Way F 1.5, 2.8, 6.3 CTS, 9.5 MCON-LL Series(BU)

Terminal Part Information

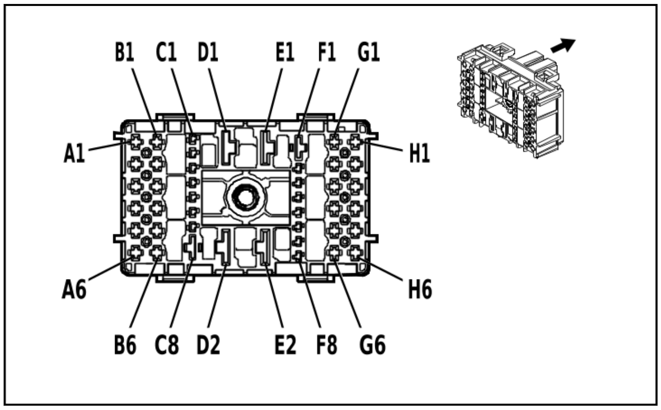
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19369711	J-35616-14 (GN)	J-38125-557
II	84764079	J-35616-22 (RD)	J-38125-11A
III	84779405	J-35616-35 (VT)	J-38125-212

X50A Engine Wiring Harness Junction Block X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A1	—	—	—	Not Occupied	—	—
A2	1.5	RD / BU	540	Battery Positive Voltage	III	—
A3	0.35	BN / VT	193	Rear Defogger Relay Control	III	—
A4	1	BK	650	Ground	III	—
A5	0.75	GY / VT	228	Windshield Washer Pump Control	III	—
A6 - B1	—	—	—	Not Occupied	—	—
B2	2.5	BN / VT	293	Rear Defogger Grid Control	III	—
B3 - C2	—	—	—	Not Occupied	—	—
C3	0.5	WH / GN	4628	DC/AC Inverter Relay Control	I	—
C4	0.35	BN / GY	2268	Windshield Washer Relay Control	I	—
C5 - C8	—	—	—	Not Occupied	—	—
D1	5	BN / BK	4629	DC/AC Inverter Control	II	—
D2	6	RD / WH	1642	Battery Positive Voltage	II	—
E1	—	—	—	Not Occupied	—	—
E2	6	RD / WH	1040	Battery Positive Voltage	II	—
F1 - F5	—	—	—	Not Occupied	—	—
F6	0.35	WH / VT	860	Windshield Wiper Switch High Signal	I	—
F7 - G2	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
G3	0.35	BU / VT	807	Ignition Off/Accessory Ignition Voltage	III	—
G4	0.5	GN / VT	5199	Run/Crank Relay Coil Control	III	—
G5	2	BK	150	Ground	III	—
G6	0.35	GY	91	Windshield Wiper Motor Relay Coil Control	III	—
H1	0.5	VT / BK	339	Run/Crank Ignition 1 Voltage	III	—
H2	0.75	VT / WH	1139	Run/Crank Ignition 1 Voltage	III	—
H3	0.5	VT / BK	739	Run/Crank Ignition 1 Voltage	III	—
H4	0.5	VT / WH	239	Run/Crank Ignition 1 Voltage	III	—
H5	2	WH	92	Windshield Wiper Motor High Speed Control	III	—
H6	2	YE / BN	95	Windshield Wiper Motor Low Speed Control	III	—

X50A Engine Wiring Harness Junction Block X2



4994132

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 33384594
- Service Connector: 19371174
- Description: 44-Way F 1.5, 2.8, 6.3 CTS, 9.5 MCON-LL Series(GN)

Terminal Part Information

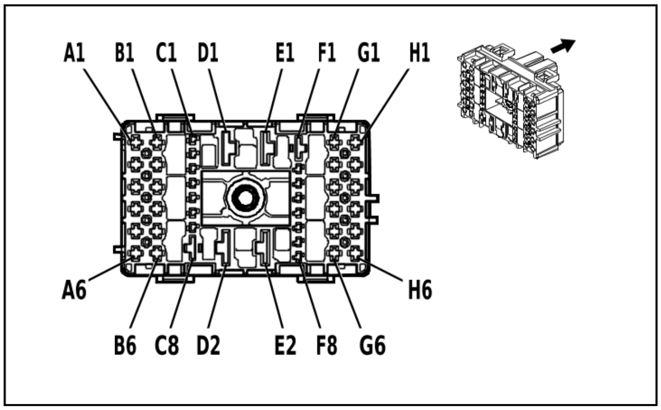
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19369711	J-35616-14 (GN)	J-38125-557
II	84779405	J-35616-35 (VT)	J-38125-212
III	Not required	J-35616-22 (RD)	No Tool Required

X50A Engine Wiring Harness Junction Block X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A1 - A4	—	—	—	Not Occupied	—	—
A5	1.5	RD / WH	640	Battery Positive Voltage	II	—
A6	1.5	RD / YE	740	Battery Positive Voltage	II	—
B1 - B4	—	—	—	Not Occupied	—	—
B5	0.5	RD / BU	840	Battery Positive Voltage	II	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
B6	1	GN / YE	6840	Auxiliary Device 2 Switched Voltage	II	—
C1	0.35	YE / BU	318	Left Rear Trailer Stop/Turn Lamp Control	I	—
C2	0.35	GN / BN	319	Right Rear Trailer Stop/Turn Lamp Control	I	—
C3 - D1	—	—	—	Not Occupied	—	—
D2	10	RD / GY	142	Battery Positive Voltage	III	—
E1	—	—	—	Not Occupied	—	—
E2	10	RD / GN	242	Battery Positive Voltage	III	—
F1	—	—	—	Not Occupied	—	—
F2	0.35 0.5	BN / YE BN / YE	820 820	Center High Mounted Stop Lamp Supply Voltage Center High Mounted Stop Lamp Supply Voltage	I I	— —
F3	0.35	BU / BN	38	Backup Lamp Relay Control	I	—
F4	0.35	BN / WH	28	Horn Relay Control	I	—
F5 - F8	—	—	—	Not Occupied	—	—
G1	0.75	BN / GY	29	Horn Control	II	—
G2	—	—	—	Not Occupied	—	—
G3	0.5	BN / GN	4246	Identification Lamp Control	II	—
G4	—	—	—	Not Occupied	—	—
G5	1.5	RD / BN	1440	Battery Positive Voltage	II	—
G6	1	RD / BN	1140	Battery Positive Voltage	II	—
H1	0.5	BU / BK	1053	Center High Mounted Stop Lamp Control 3	II	—
H2 - H5	—	—	—	Not Occupied	—	—
H6	0.35	WH / BN	7055	Auxiliary Park Lamp Relay Control	II	—

X50A Engine Wiring Harness Junction Block X3



4992608

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 33384584
- Service Connector: 19371176
- Description: 44-Way F 1.5, 2.8, 6.3 CTS, 9.5 MCON-LL Series(GY)

Terminal Part Information

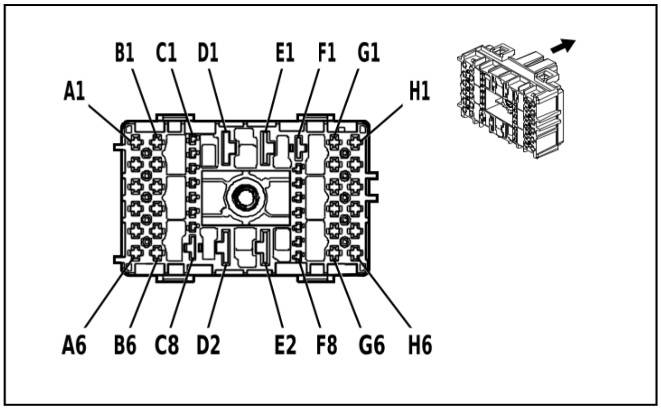
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19369711	J-35616-14 (GN)	J-38125-557
II	84764078	J-35616-42 (RD)	J-38125-221
III	84779405	J-35616-35 (VT)	J-38125-212

X50A Engine Wiring Harness Junction Block X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A1	0.75	VT / GN	439	Run/Crank Ignition 1 Voltage	III	—
A2 - A3	—	—	—	Not Occupied	—	—
A4	0.75	BN / GN	59	Air Conditioning Compressor Clutch Control	III	—
A5	—	—	—	Not Occupied	—	—
A6	0.5	GN	8016	Secondary Axle Motor Control	III	—
B1	0.5	WH	2368	Cooling Fan Control Signal	III	—
B2	0.5	VT / BU	5705	Powertrain Main Relay Control	III	—
B3	0.5	VT / GY	8017	Secondary Axle Motor Relay Control	III	—
B4 - B5	—	—	—	Not Occupied	—	—
B6	3	GN / RD	6042	Cruise Control Switch 5V Reference	III	—
C1	0.5	BU	3017	Fuel Heater Relay 1 Control	I	—
C2	0.5	WH / BK	2366	Cooling Fan Speed Control Signal	I	—
C3	1.5	BK	450	Ground	I	—
C4	0.5	WH / GY	459	Air Conditioning Compressor Clutch Relay Control	I	—
C5	0.5	GN / BU	3889	Powertrain Sensor Bus Relay Control	I	—
C6	0.75	VT / GN	4320	Powertrain Sensor Bus Enable	I	—
C7 - E2	—	—	—	Not Occupied	—	—
F1	2.5	YE	6	Starter Solenoid Crank Ignition Voltage	II	—
F2	0.5	YE / BK	625	Starter Enable Relay Control	I	—
F3	0.5 0.75	RD / BN RD / BN	440 440	Battery Positive Voltage Battery Positive Voltage	I I	— —
F4	0.5	YE	5991	Powertrain Relay Coil Control	I	—
F5	0.5	RD / WH	3440	Battery Positive Voltage	I	—
F6	—	—	—	Not Occupied	—	—
F7	0.5	VT / BU	5705	Powertrain Main Relay Control	I	—
F8 - G1	—	—	—	Not Occupied	—	—
G2	1	VT / BU	5292	Powertrain Main Relay Fused Supply Voltage 3	III	—
G3	—	—	—	Not Occupied	—	—
G4	0.75	VT / BU	5293	Powertrain Main Relay Fused Supply Voltage 4	III	—
G5	1.5	VT / GN	4320	Powertrain Sensor Bus Enable	III	—
G6	0.75	VT / BU	5291	Powertrain Main Relay Fused Supply Voltage 2	III	—
H1	2.5 4	VT / BU VT / BU	5290 5290	Powertrain Main Relay Fused Supply Voltage 1 Powertrain Main Relay Fused Supply Voltage 1	III III	— —
H2	0.75	VT / BU	5292	Powertrain Main Relay Fused Supply Voltage 3	III	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
H3	1	VT / BU	5294	Powertrain Main Relay Fused Supply Voltage 5	III	—
H4	0.75	VT / BU	5293	Powertrain Main Relay Fused Supply Voltage 4	III	—
H5	1	VT / BU	5291	Powertrain Main Relay Fused Supply Voltage 2	III	—
H6	0.75 2.5	VT / BU VT / BU	5290 5290	Powertrain Main Relay Fused Supply Voltage 1 Powertrain Main Relay Fused Supply Voltage 1	III III	— —

X50A Engine Wiring Harness Junction Block X4



4993031

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 33384574
- Service Connector: 19371188
- Description: 44-Way F 1.5, 2.8, 6.3 CTS, 9.5 MCON-LL Series(BK)

Terminal Part Information

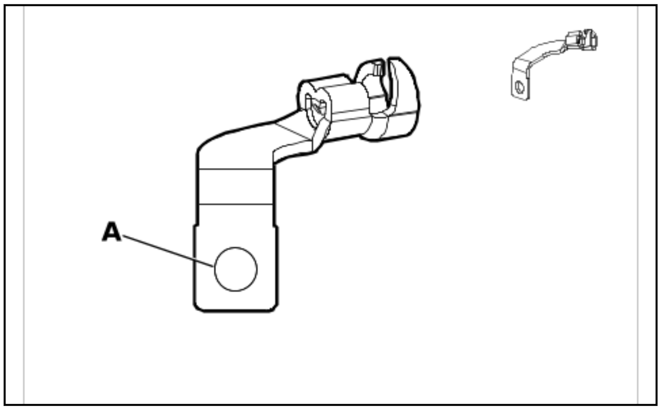
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19369711	J-35616-14 (GN)	J-38125-557
II	84764078	J-35616-42 (RD)	J-38125-221
III	84764079	J-35616-22 (RD)	J-38125-11A
IV	84779405	J-35616-35 (VT)	J-38125-212

X50A Engine Wiring Harness Junction Block X4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A1 - A2	—	—	—	Not Occupied	—	—
A3	1.5	BN	2109	Trailer Park Lamp Control	IV	—
A4	0.5	RD / WH	6440	Battery Positive Voltage	IV	—
A5	—	—	—	Not Occupied	—	—
A6	0.5	VT / WH	639	Run/Crank Ignition 1 Voltage	IV	—
B1	0.5	RD / WH	640	Battery Positive Voltage	IV	—
B2	1	GY	1624	Trailer Backup Lamp Control	IV	—
B3	1.5	RD / GN	2440	Battery Positive Voltage	IV	—
B4	0.5	RD / GN	6940	Battery Positive Voltage	IV	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
B5 - B6	—	—	—	Not Occupied	—	—
C1	0.5	RD / WH	5740	Battery Positive Voltage	I	—
C2 - C6	—	—	—	Not Occupied	—	—
C7	0.5	RD / WH	3440	Battery Positive Voltage	I	—
C8	2.5	BN / YE	2996	Fuel Heater Control 1	II	—
D1	—	—	—	Not Occupied	—	—
D2	4	RD / BN	3640	Battery Positive Voltage	III	—
E1 - E2	—	—	—	Not Occupied	—	—
F1	2.5	RD / WH	2040	Battery Positive Voltage	II	—
F2 - G2	—	—	—	Not Occupied	—	—
G3	1	YE	1618	Left Rear Trailer Stop/Turn Lamp Control	IV	—
G4	2.5	RD / YE	5840	Battery Positive Voltage	IV	—
G5	1.5	RD / BN	5940	Battery Positive Voltage	IV	—
G6	2.5	RD / WH	1040	Battery Positive Voltage	IV	—
H1 - H2	—	—	—	Not Occupied	—	—
H3	1	GN	1619	Right Rear Trailer Stop/Turn Lamp Control	IV	—
H4	2.5	RD / VT	5640	Battery Positive Voltage	IV	—
H5	2.5	RD / VT	1940	Battery Positive Voltage	IV	—
H6	4 4	OG RD / BU	3940 3940	Battery Positive Voltage Battery Positive Voltage	IV IV	— —

X50A Engine Wiring Harness Junction Block X5 (L5P)



6443464

Connector Part Information
- Harness Type: Battery Positive Cable
- OEM Connector: 84537526
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

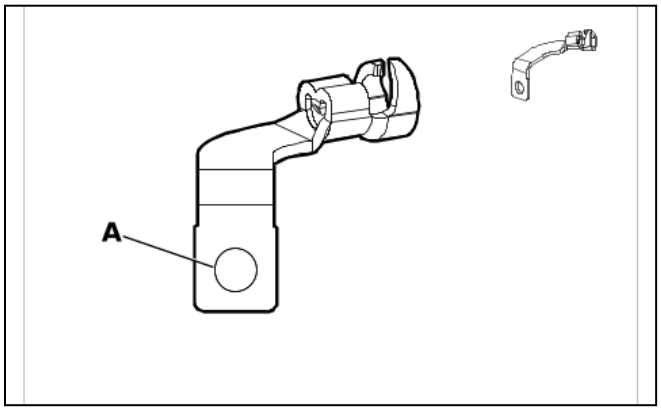
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50A Engine Wiring Harness Junction Block X5 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / YE	2	Battery Positive Voltage	I	L5P

X50A Engine Wiring Harness Junction Block X5 (L8T - K4Z)



6443464

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 84537526
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

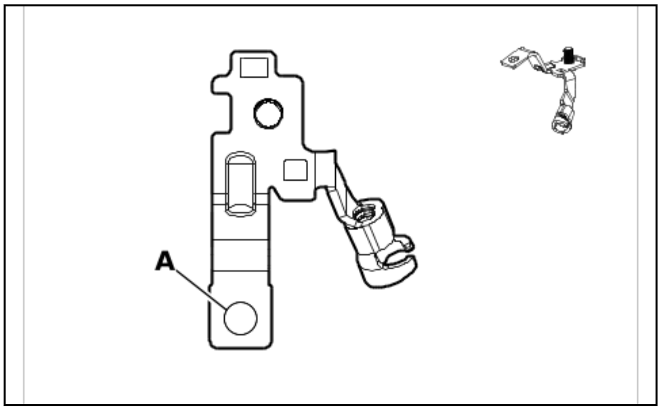
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50A Engine Wiring Harness Junction Block X5 (L8T - K4Z)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / GN	242	Battery Positive Voltage	I	L8T- KHF

X50A Engine Wiring Harness Junction Block X5 (L8T & K4Z)



6758163

Connector Part Information
- Harness Type: Battery Positive Cable
- OEM Connector: 85664828
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

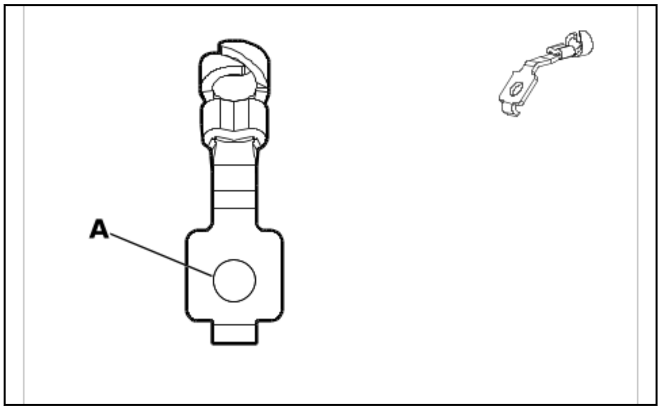
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50A Engine Wiring Harness Junction Block X5 (L8T & K4Z)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / GN	242	Battery Positive Voltage	I	KHF+ L8T

X50A Engine Wiring Harness Junction Block X5 (L8T & KHF)



6444148

Connector Part Information
- Harness Type: Auxiliary Generator Battery Jumper Cable
- OEM Connector: 84386099
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

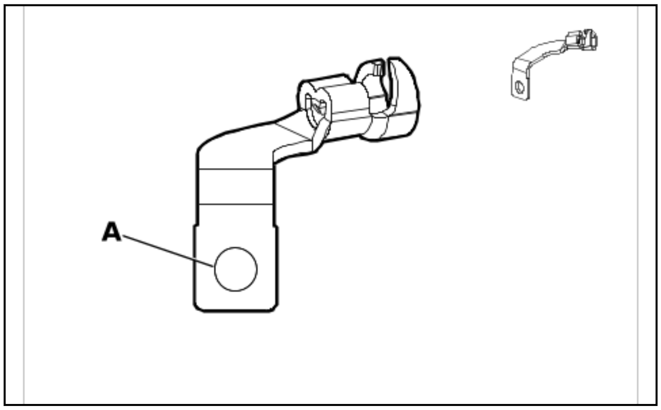
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50A Engine Wiring Harness Junction Block X5 (L8T & KHF)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / YE	2	Battery Positive Voltage	I	KHF+ L8T

X50A Engine Wiring Harness Junction Block X5 (L8T & KW5 & K4Z)



6443464

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 84537526
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

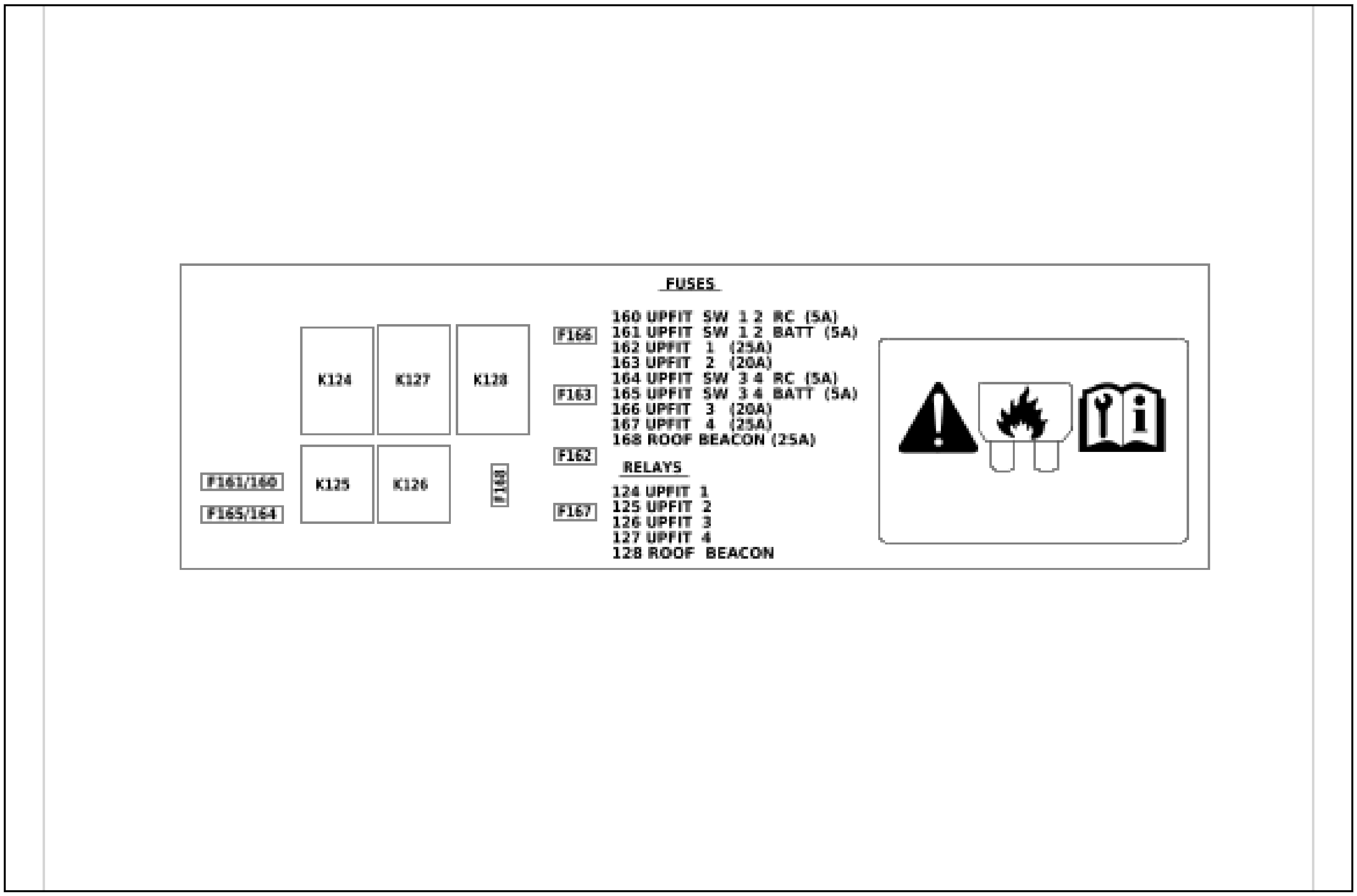
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X50A Engine Wiring Harness Junction Block X5 (L8T & KW5 & K4Z)

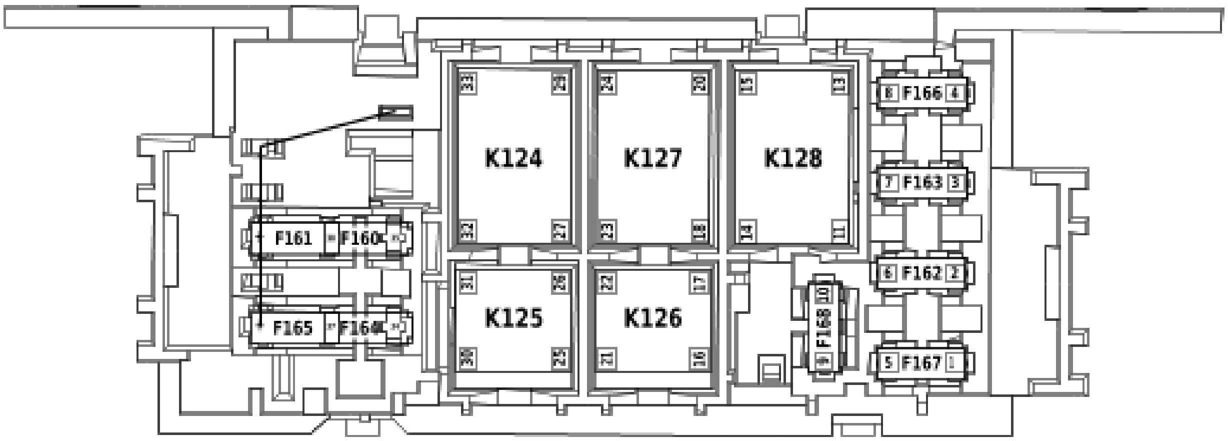
Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / GN	242	Battery Positive Voltage	I	L8T- KHF

X51AX Instrument Panel Wiring Harness Junction Block - Auxiliary Label (9L7)


FUSES
160 UPFIT SW 1 2 RC (5A)
161 UPFIT SW 1 2 BATT (5A)
162 UPFIT 1 (25A)
163 UPFIT 2 (20A)
164 UPFIT SW 3 4 RC (5A)
165 UPFIT SW 3 4 BATT (5A)
166 UPFIT 3 (20A)
167 UPFIT 4 (25A)
168 ROOF BEACON (25A)
RELAYS
124 UPFIT 1
125 UPFIT 2
126 UPFIT 3
127 UPFIT 4
128 ROOF BEACON
K124
K127
K128
K125
K126
F168
F166
F163
F162
F167
F161/160
F165/164

5969422

X51AX Instrument Panel Wiring Harness Junction Block - Auxiliary Top View (9L7)



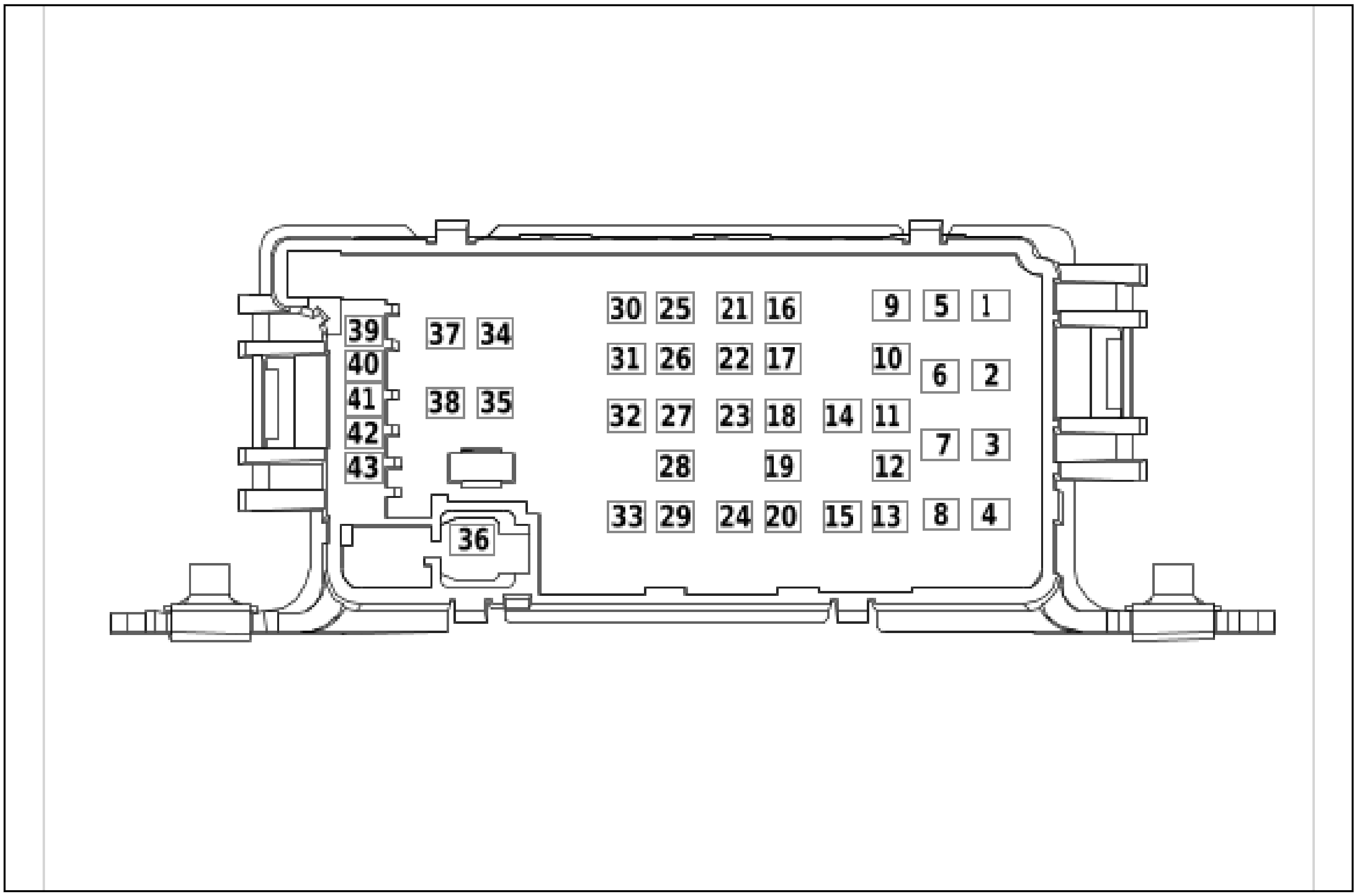
5988611

Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Fuses				
F160	UPFIT SW 1 2 RC	F160DA	5A	• KR161AA Configurable/Accessory Provision Relay 1 • KR161BA Configurable/Accessory Provision Relay 2
F161	UPFIT SW 1 2 BATT	F161DA	5A	• KR161AA Configurable/Accessory Provision Relay 1 • KR161BA Configurable/Accessory Provision Relay 2
F162	UPFIT 1	F162DA	25A	• X79A Configurable/Accessory Provision Supply Connector
F163	UPFIT 2	F163DA	20A	• X79A Configurable/Accessory Provision Supply Connector
F164	UPFIT SW 3 4 RC	F164DA	5A	• KR161CA Configurable/Accessory Provision Relay 3 • KR161DA Configurable/Accessory Provision Relay 4 • KR161EA Configurable/Accessory Provision Relay 5
F165	UPFIT SW 3 4 BATT	F165DA	5A	• KR161CA Configurable/Accessory Provision Relay 3 • KR161DA Configurable/Accessory Provision Relay 4 • KR161EA Configurable/Accessory Provision Relay 5
F166	UPFIT 3	F166DA	20A	• X79A Configurable/Accessory Provision Supply Connector

No.	Device Label Name	Device Assigned Name	Rating	Description
F167	UPFIT 4	F167DA	25A	- X79A Configurable/Accessory Provision Supply Connector
F168	ROOF BEACON	F168DA	25A	- W11 Blunt Cut - Emergency Vehicle Roof Lamp
Relays				
K124	UPFIT 1	KR161AA Configurable/ Accessory Provision Relay 1	—	- F162DA
K125	UPFIT 2	KR161BA Configurable/ Accessory Provision Relay 2	—	- F163DA
K126	UPFIT 3	KR161CA Configurable/ Accessory Provision Relay 3	—	- F166DA
K127	UPFIT 4	KR161DA Configurable/ Accessory Provision Relay 4	—	- F167DA
K128	ROOF BEACON	KR161EA Configurable/ Accessory Provision Relay 5	—	- F168DA

X51AX Instrument Panel Wiring Harness Junction Block - Auxiliary Wire Entry View



Connector Part Information
- Harness Type: Auxiliary Fuse Block Wiring Harness
- OEM Connector: 33323307
- Service Connector: Service by Component Assembly - See Part Catalog
- Description: Wire Entry Fuse Block

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-22 (RD)	No Tool Required
II	Not required	J-35616-35 (VT)	No Tool Required
III	Not required	J-35616-4A (PU)	No Tool Required

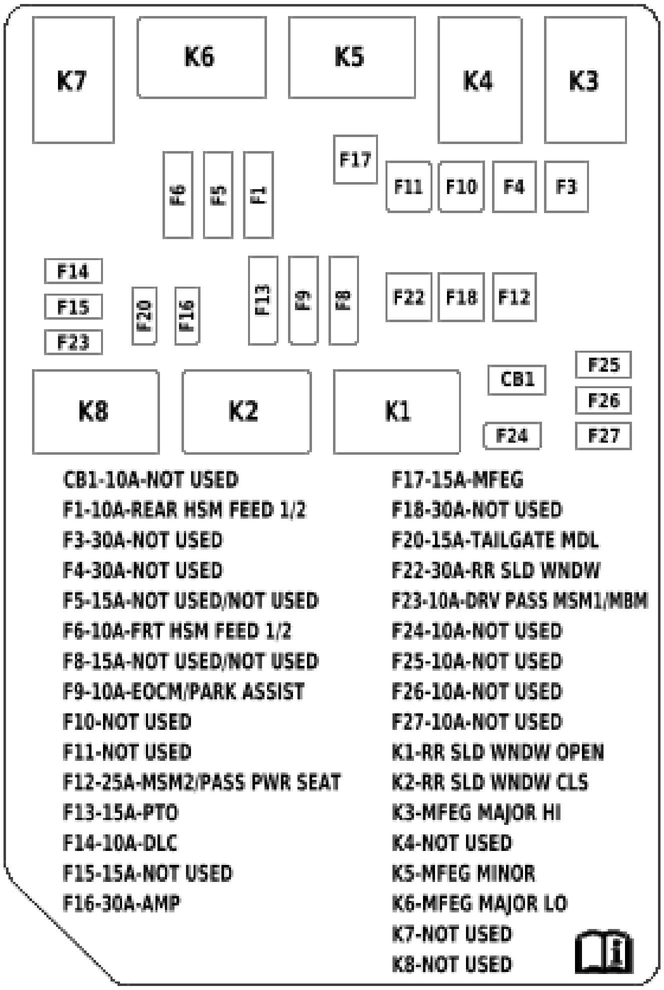
X51AX Instrument Panel Wiring Harness Junction Block - Auxiliary Wire Entry View

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) YE / BN	(1) 10734	(1) Upfitter Accessory 4 Supply Voltage	(1) III	(1) —
(2) 2	(2) 2.5	(2) BU	(2) 10731	(2) Upfitter Accessory 1 Supply Voltage	(2) III	(2) —
(3) 3	(3) 2.5	(3) GY / BK	(3) 10732	(3) Upfitter Accessory 2 Supply Voltage	(3) III	(3) —
(4) 4	(4) 2.5	(4) BN / WH	(4) 10733	(4) Upfitter Accessory 3 Supply Voltage	(4) III	(4) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(5) 5	(5) 2.5	(5) YE	(5) 10729	(5) Upfitter Accessory Fuse 4 Supply Voltage	(5) III	(5) —
(6) 6	(6) 2.5	(6) BU / GN	(6) 10726	(6) Upfitter Accessory Fuse 1 Supply Voltage	(6) III	(6) —
(7) 7	(7) 2.5	(7) GY	(7) 10727	(7) Upfitter Accessory Fuse 2 Supply Voltage	(7) III	(7) —
(8) 8	(8) 2.5	(8) BN	(8) 10728	(8) Upfitter Accessory Fuse 3 Supply Voltage	(8) III	(8) —
(9) 9	(9) 2.5	(9) VT / BU	(9) 10735	(9) Upfitter Accessory 5 Supply Voltage	(9) III	(9) —
(10) 10	(10) 2.5	(10) VT	(10) 10730	(10) Upfitter Accessory Fuse 5 Supply Voltage	(10) III	(10) —
(11) 11	(11) 2.5	(11) VT	(11) 10730	(11) Upfitter Accessory Fuse 5 Supply Voltage	(11) III	(11) —
(13) 13	(13) 0.35	(13) VT / BN	(13) 10723	(13) Upfitter Accessory Relay 3 Coil Supply Voltage	(13) II	(13) —
(14) 14	(14) 0.35	(14) GY / VT	(14) 10720	(14) Upfitter Accessory Relay 5 Coil Control	(14) II	(14) —
(15) 15	(15) 2.5	(15) RD / VT	(15) 542	(15) Battery Positive Voltage	(15) III	(15) —
(16) 16	(16) 2.5	(16) RD / VT	(16) 542	(16) Battery Positive Voltage	(16) III	(16) —
(17) 17	(17) 0.35	(17) GN / BN	(17) 10718	(17) Upfitter Accessory Relay 3 Coil Control	(17) II	(17) —
(18) 18	(18) 2.5	(18) YE	(18) 10729	(18) Upfitter Accessory Fuse 4 Supply Voltage	(18) III	(18) —
(20) 20	(20) 0.35	(20) VT / BN	(20) 10723	(20) Upfitter Accessory Relay 3 Coil Supply Voltage	(20) III	(20) —
(21) 21	(21) 0.35	(21) VT / BN	(21) 10723	(21) Upfitter Accessory Relay 3 Coil Supply Voltage	(21) III	(21) —
(22) 22	(22) 2.5	(22) BN	(22) 10728	(22) Upfitter Accessory Fuse 3 Supply Voltage	(22) III	(22) —
(23) 23	(23) 0.35	(23) WH / YE	(23) 10719	(23) Upfitter Accessory Relay 4 Coil Control	(23) II	(23) —
(24) 24	(24) 2.5	(24) RD / VT	(24) 542	(24) Battery Positive Voltage	(24) III	(24) —
(25) 25	(25) 2.5	(25) RD / VT	(25) 542	(25) Battery Positive Voltage	(25) III	(25) —
(26) 26	(26) 0.35	(26) VT / GY	(26) 10717	(26) Upfitter Accessory Relay 2 Coil Control	(26) II	(26) —
(27) 27	(27) 2.5	(27) BU / GN	(27) 10726	(27) Upfitter Accessory Fuse 1 Supply Voltage	(27) III	(27) —
(29) 29	(29) 0.35	(29) BU / VT	(29) 10721	(29) Upfitter Accessory Relay 1 Coil Supply Voltage	(29) III	(29) —
(30) 30	(30) 0.35	(30) BU / VT	(30) 10721	(30) Upfitter Accessory Relay 1 Coil Supply Voltage	(30) II	(30) —
(31) 31	(31) 2.5	(31) GY	(31) 10727	(31) Upfitter Accessory Fuse 2 Supply Voltage	(31) III	(31) —
(32) 32	(32) 0.35	(32) BU / WH	(32) 10716	(32) Upfitter Accessory Relay 1 Coil Control	(32) II	(32) —
(33) 33	(33) 2.5	(33) RD / VT	(33) 542	(33) Battery Positive Voltage	(33) III	(33) —
(34) 34	(34) 0.5	(34) VT / BK	(34) 339	(34) Run/Crank Ignition 1 Voltage	(34) III	(34) —
(35) 35	(35) 0.5	(35) VT / BK	(35) 339	(35) Run/Crank Ignition 1 Voltage	(35) III	(35) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(36) 36	(36) 10	(36) RD / VT	(36) 542	(36) Battery Positive Voltage	(36) I	(36) —
(37) 37	(37) 0.35	(37) VT / BN	(37) 10723	(37) Upfitter Accessory Relay 3 Coil Supply Voltage	(37) II	(37) —
(38) 38	(38) 0.35	(38) BU / VT	(38) 10721	(38) Upfitter Accessory Relay 1 Coil Supply Voltage	(38) II	(38) —
(39) 39	(39) 2.5	(39) RD / VT	(39) 542	(39) Battery Positive Voltage	(39) III	(39) —
(40) 40	(40) 2.5	(40) RD / VT	(40) 542	(40) Battery Positive Voltage	(40) III	(40) —
(41) 41	(41) 2.5	(41) RD / VT	(41) 542	(41) Battery Positive Voltage	(41) III	(41) —
(42) 42	(42) 2.5	(42) RD / VT	(42) 542	(42) Battery Positive Voltage	(42) III	(42) —
(43) 43	(43) 2.5	(43) RD / VT	(43) 542	(43) Battery Positive Voltage	(43) III	(43) —

X53AF Body Wiring Harness Junction Block Label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F4
F3
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F23
F20
F16
F13
F9
F8
F22
F18
F12
F25
CB1
F26
K8
K2
K1
F24
F27

CB1-10A-NOT USED
F1-10A-REAR HSM FEED 1/2
F3-30A-NOT USED
F4-30A-NOT USED
F5-15A-NOT USED/NOT USED
F6-10A-FRT HSM FEED 1/2
F8-15A-NOT USED/NOT USED
F9-10A-EOCM/PARK ASSIST
F10-NOT USED
F11-NOT USED
F12-25A-MSM2/PASS PWR SEAT
F13-15A-PTO
F14-10A-DLC
F15-15A-NOT USED
F16-30A-AMP
F17-15A-MFEG
F18-30A-NOT USED
F20-15A-TAILGATE MDL
F22-30A-RR SLD WNDW
F23-10A-DRV PASS MSM1/MBM
F24-10A-NOT USED
F25-10A-NOT USED
F26-10A-NOT USED
F27-10A-NOT USED
K1-RR SLD WNDW OPEN
K2-RR SLD WNDW CLS
K3-MFEG MAJOR HI
K4-NOT USED
K5-MFEG MINOR
K6-MFEG MAJOR LO
K7-NOT USED
K8-NOT USED

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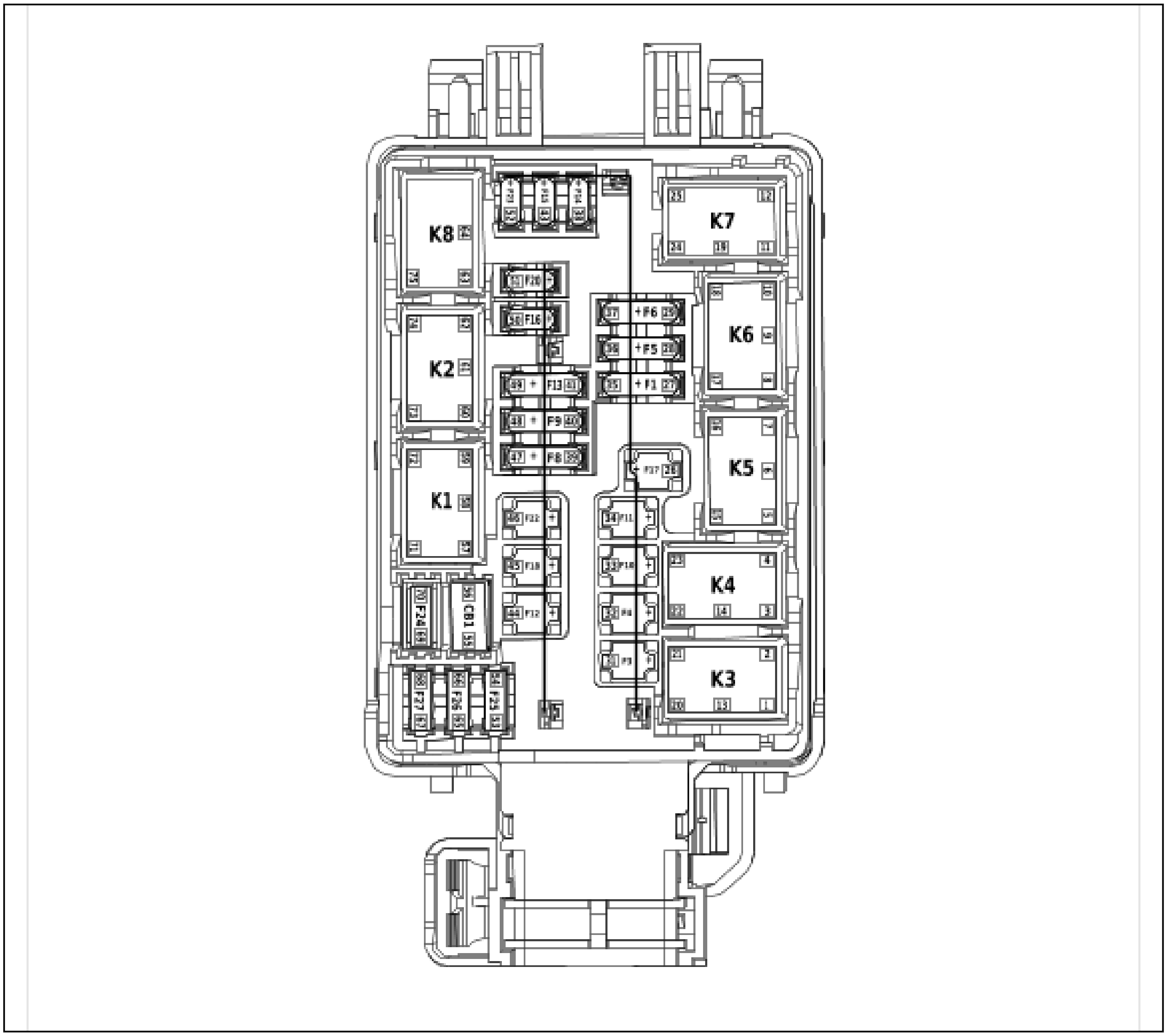
X53AF Body Wiring Harness Junction Block Top View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F18
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F12
F8
K4
F24
CB1
F3
K3
F27
F26
F25

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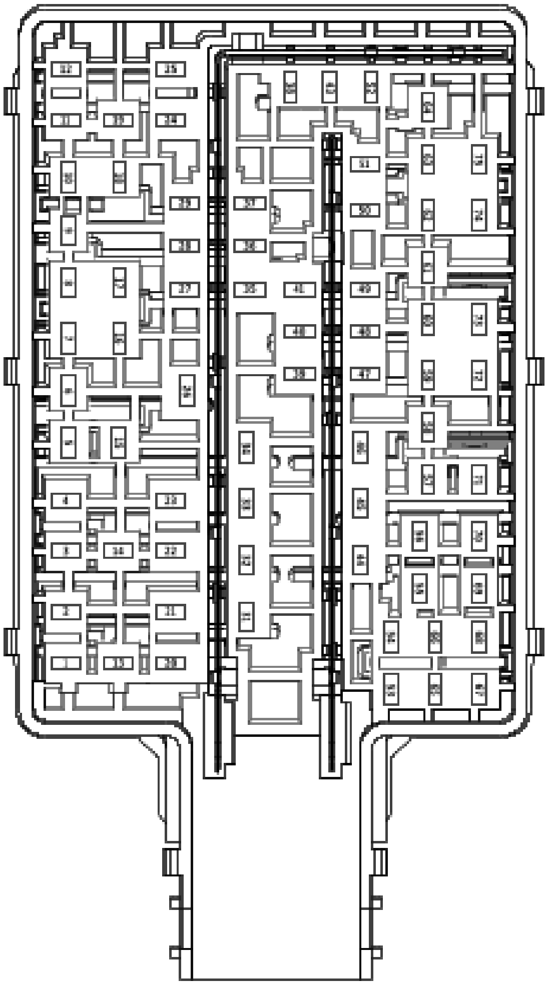
Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Fuses				
F1	REAR HSM FEED 1/2	F1DL	10A	• K234 Rear Seat Heater Vent Control Module (KA6)
F3	NOT USED	F3DL	30A	• Not Used
F4	NOT USED	F4DL	30A	• Not Used
F5	NOT USED/NOT USED	F5DL	15A	• Not Used
F6	FRT HSM FEED 1/2	F6DL	10A	• K29FV Front Seat Heater Vent Control Module (KA1/ KQV)

No.	Device Label Name	Device Assigned Name	Rating	Description
F8	NOT USED/NOT USED	F8DL	15A	- Not Used
F9	EOCM/PARK ASSIST	F9DL	10A	- K182 Parking Assist Control Module (UD5/UD7)
F10	NOT USED	F10DL	30A	- Not Used
F11	NOT USED	F11DL	30A	- Not Used
F12	MSM2/PASS PWR SEAT	F12DL	25A	- S64P Front Seat Adjuster Switch - Passenger (A7K-AKE)
F13	PTO	F13DL	15A	- K44 Power Takeoff Control Module - X175P Connector
F14	DLC	F14DL	10A	- X84 Data Link Connector
F15	NOT USED	F15DL	15A	- Not Used
F16	AMP	F16DL	30A	- T3 Audio Amplifier (UQA)
F17	MFEG	F17DL	15A	- KR191S Pickup Box Endgate Latch Relay - Supply Voltage (QT5) - KR192 Pickup Box Auxiliary Endgate Latch Relay (QT5)
F18	NOT USED	F18DL	30A	- Not Used
F20	TAILGATE MDL	F20DL	15A	- K194 Rear Gate Module (QT6)
F22	RR SLD WNDW	F22DL	30A	- KR206C Rear Sliding Window Close Relay (A48) - KR206O Rear Sliding Window Open Relay (A48)
F23	DRV PASS MSM1/MBM	F23DL	10A	- K40D Driver Seat Adjuster Memory Module (A45) - S64D Front Seat Adjuster Switch - Driver (A45) - S65D Front Seat Lumbar Switch - Driver - S65P Front Seat Lumbar Switch - Passenger
F24	NOT USED	F24DL	10A	- Not Used
F25	NOT USED	F25DL	10A	- Not Used
F26	NOT USED	F26DL	10A	- Not Used
F27	NOT USED	F27DL	10A	- Not Used
Circuit Breakers				
CB1	NOT USED	CB1DL	10A	- Not Used
Relays				
K1	RR SLD WNDW OPEN	KR206O Rear Sliding Window Open Relay	—	- M63 Rear Sliding Window Motor (A48)
K2	RR WNDW CLS	KR206C Rear Sliding Window Close Relay	—	- M63 Rear Sliding Window Motor (A48)
K3	MFEG MAJOR HI	KR191G Pickup Box Endgate Latch Relay - Ground	—	- A99L Pickup Box Endgate Latch - Left (QK2+QT5) - A99R Pickup Box Endgate Latch - Right (QK2+QT5) - M14A Pickup Box Endgate Lock Actuator (QK1+QT5)
K4	NOT USED	—	—	- Not Used
K5	MFEG MINOR	KR192 Pickup Box Auxiliary Endgate Latch Relay	—	- A100L Pickup Box Auxiliary Endgate Latch - Left (QK2+QT5) - A100R Pickup Box Auxiliary Endgate Latch - Right (QK2+QT5)

No.	Device Label Name	Device Assigned Name	Rating	Description
K6	MFEG MAJOR LO	KR191S Pickup Box Endgate Latch Relay - Supply Voltage	—	• A99L Pickup Box Endgate Latch - Left (QK2+QT5) • A99R Pickup Box Endgate Latch - Right (QK2+QT5) • M14A Pickup Box Endgate Lock Actuator (QT5)
K7	NOT USED	—	—	• Not Used
K8	NOT USED	—	—	• Not Used

X53AF Body Wiring Harness Junction Block Wire Entry View



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Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 84596390
- Service Connector: Service by Component Assembly - See Part Catalog
- Description: Wire Entry Fuse Block

Terminal Part Information

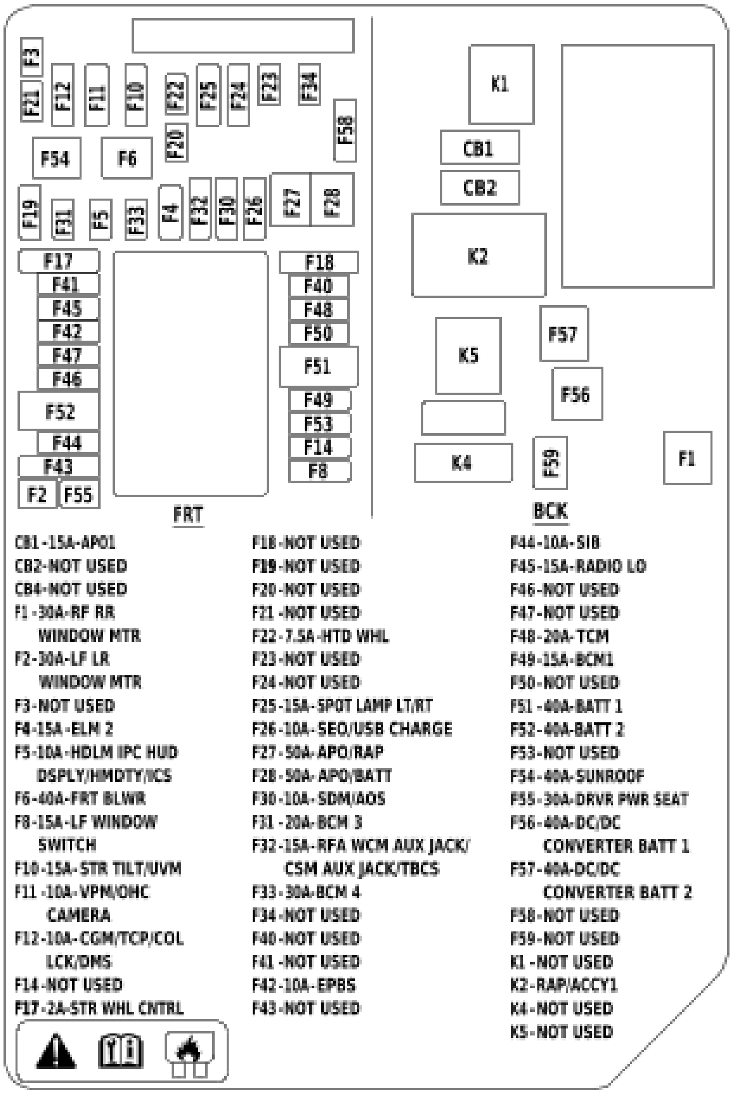
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13575574	J-35616-5 (PU)	J-38125-215A
II	13578850	J-35616-5 (PU)	J-38125-215A
III	19332366	J-35616-35 (VT)	J-38125-212
IV	Not required	J-35616-22 (RD)	No Tool Required

X53AF Body Wiring Harness Junction Block Wire Entry View

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) WH / GN	(1) 7728	(1) Major Endgate High Relay Control	(1) III	(1) —
(2) 2	(2) 1	(2) GN	(2) 1299	(2) Major Endgate Motor Control	(2) III	(2) —
(5) 5	(5) 1	(5) VT	(5) 7725	(5) Minor Endgate Motor Control	(5) III	(5) —
(7) 7	(7) 0.75	(7) WH / GY	(7) 7297	(7) Minor Endgate High Relay Control	(7) III	(7) —
(8) 8	(8) 1.5	(8) BK	(8) 1550	(8) Ground	(8) III	(8) —
(10) 10	(10) 0.75	(10) BU / VT	(10) 7729	(10) Major Endgate Low Relay Control	(10) III	(10) —
(15) 15	(15) 0.5	(15) BK	(15) 1550	(15) Ground	(15) III	(15) —
(16) 16	(16) 1	(16) RD / BN	(16) 8240	(16) Battery Positive Voltage	(16) III	(16) —
(17) 17	(17) 0.5	(17) BK	(17) 1550	(17) Ground	(17) III	(17) —
(18) 18	(18) 1	(18) YE / BK	(18) 7730	(18) Major Endgate Motor Low Reference	(18) III	(18) —
(20) 20	(20) 1	(20) RD / BN	(20) 8240	(20) Battery Positive Voltage	(20) III	(20) —
(21) 21	(21) 0.5	(21) BK	(21) 1550	(21) Ground	(21) III	(21) —
(26) 26	(26) 1	(26) RD / BN	(26) 8240	(26) Battery Positive Voltage	(26) II	(26) —
(27) 27	(27) 0.75	(27) RD / WH	(27) 5740	(27) Battery Positive Voltage	(27) III	(27) —
(29) 29	(29) 0.75	(29) RD / BN	(29) 6640	(29) Battery Positive Voltage	(29) III	(29) —
(30) 30	(30) 10	(30) RD / GY	(30) 142	(30) Battery Positive Voltage	(30) IV	(30) —
(35) 35	(35) 0.75	(35) RD / BU	(35) 6740	(35) Battery Positive Voltage	(35) III	(35) —
(37) 37	(37) 0.75	(37) RD / GN	(37) 6140	(37) Battery Positive Voltage	(37) III	(37) —
(38) 38	(38) 0.5	(38) RD / YE	(38) 6540	(38) Battery Positive Voltage	(38) III	(38) —
(41) 41	(41) 0.5	(41) RD / VT	(41) 2640	(41) Battery Positive Voltage	(41) III	(41) —
(42) 42	(42) 10	(42) RD / GN	(42) 242	(42) Battery Positive Voltage	(42) IV	(42) —
(44) 44	(44) 2.5	(44) RD / YE	(44) 7440	(44) Battery Positive Voltage	(44) I	(44) —
(46) 46	(46) 2.5	(46) RD / VT	(46) 8640	(46) Battery Positive Voltage	(46) I	(46) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(48) 48	(48) 0.5	(48) RD / WH	(48) 4740	(48) Battery Positive Voltage	(48) III	(48) —
(49) 49	(49) 0.5	(49) RD / BU	(49) 4540	(49) Battery Positive Voltage	(49) III	(49) —
(50) 50	(50) 2.5	(50) RD / YE	(50) 3740	(50) Battery Positive Voltage	(50) III	(50) —
(51) 51	(51) 2.5	(51) RD / VT	(51) 4442	(51) Primary Fused Battery Positive Voltage	(51) III	(51) —
(52) 52	(52) 0.5	(52) RD / BN	(52) 2240	(52) Battery Positive Voltage	(52) III	(52) —
(57) 57	(57) 2.5	(57) RD / VT	(57) 8640	(57) Battery Positive Voltage	(57) III	(57) —
(58) 58	(58) 2.5	(58) BK	(58) 1550	(58) Ground	(58) III	(58) —
(59) 59	(59) 0.5	(59) BK	(59) 1550	(59) Ground	(59) III	(59) —
(60) 60	(60) 2.5	(60) RD / VT	(60) 8640	(60) Battery Positive Voltage	(60) III	(60) —
(61) 61	(61) 2.5	(61) BK	(61) 1550	(61) Ground	(61) III	(61) —
(62) 62	(62) 0.5	(62) BK	(62) 1550	(62) Ground	(62) III	(62) —
(71) 71	(71) 0.5	(71) YE / VT	(71) 6191	(71) Power Rear Window Switch Open Signal	(71) III	(71) —
(72) 72	(72) 2	(72) VT / YE	(72) 7453	(72) Window Motor Rear Auxiliary Open Control	(72) III	(72) —
(73) 73	(73) 0.5	(73) WH	(73) 6192	(73) Sliding Rear Window Switch Close Signal	(73) III	(73) —
(74) 74	(74) 2	(74) YE	(74) 7454	(74) Window Motor Rear Auxiliary Close Control	(74) III	(74) —

X51R Instrument Panel Wiring Harness Junction Block - Right Label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F50
F51
F49
F53
F14
F8
K5
F57
F56
K4
F59
F1
FRT
BCK

CB1-15A-APO1
CB2-NOT USED
CB4-NOT USED
F1-30A-RF RR WINDOW MTR
F2-30A-LF LR WINDOW MTR
F3-NOT USED
F4-15A-ELM 2
F5-10A-HDLM IPC HUD DSPLY/HMDTY/ICS
F6-40A-FRT BLWR
F8-15A-LF WINDOW SWITCH
F10-15A-STR TILT/UVM
F11-10A-VPM/OHC CAMERA
F12-10A-CGM/TCP/COL LCK/DMS
F14-NOT USED
F17-2A-STR WHL CNTRL
F18-NOT USED
F19-NOT USED
F20-NOT USED
F21-NOT USED
F22-7.5A-HTD WHL
F23-NOT USED
F24-NOT USED
F25-15A-SPOT LAMP LT/RT
F26-10A-SEO/USB CHARGE
F27-50A-APO/RAP
F28-50A-APO/BATT
F30-10A-SDM/AOS
F31-20A-BCM 3
F32-15A-RFA WCM AUX JACK/ CSM AUX JACK/TBCS
F33-30A-BCM 4
F34-NOT USED
F40-NOT USED
F41-NOT USED
F42-10A-EPBS
F43-NOT USED
F44-10A-SIB
F45-15A-RADIO LO
F46-NOT USED
F47-NOT USED
F48-20A-TCM
F49-15A-BCM1
F50-NOT USED
F51-40A-BATT 1
F52-40A-BATT 2
F53-NOT USED
F54-40A-SUNROOF
F55-30A-DRVR PWR SEAT
F56-40A-DC/DC CONVERTER BATT 1
F57-40A-DC/DC CONVERTER BATT 2
F58-NOT USED
F59-NOT USED
K1-NOT USED
K2-RAP/ACCY1
K4-NOT USED
K5-NOT USED

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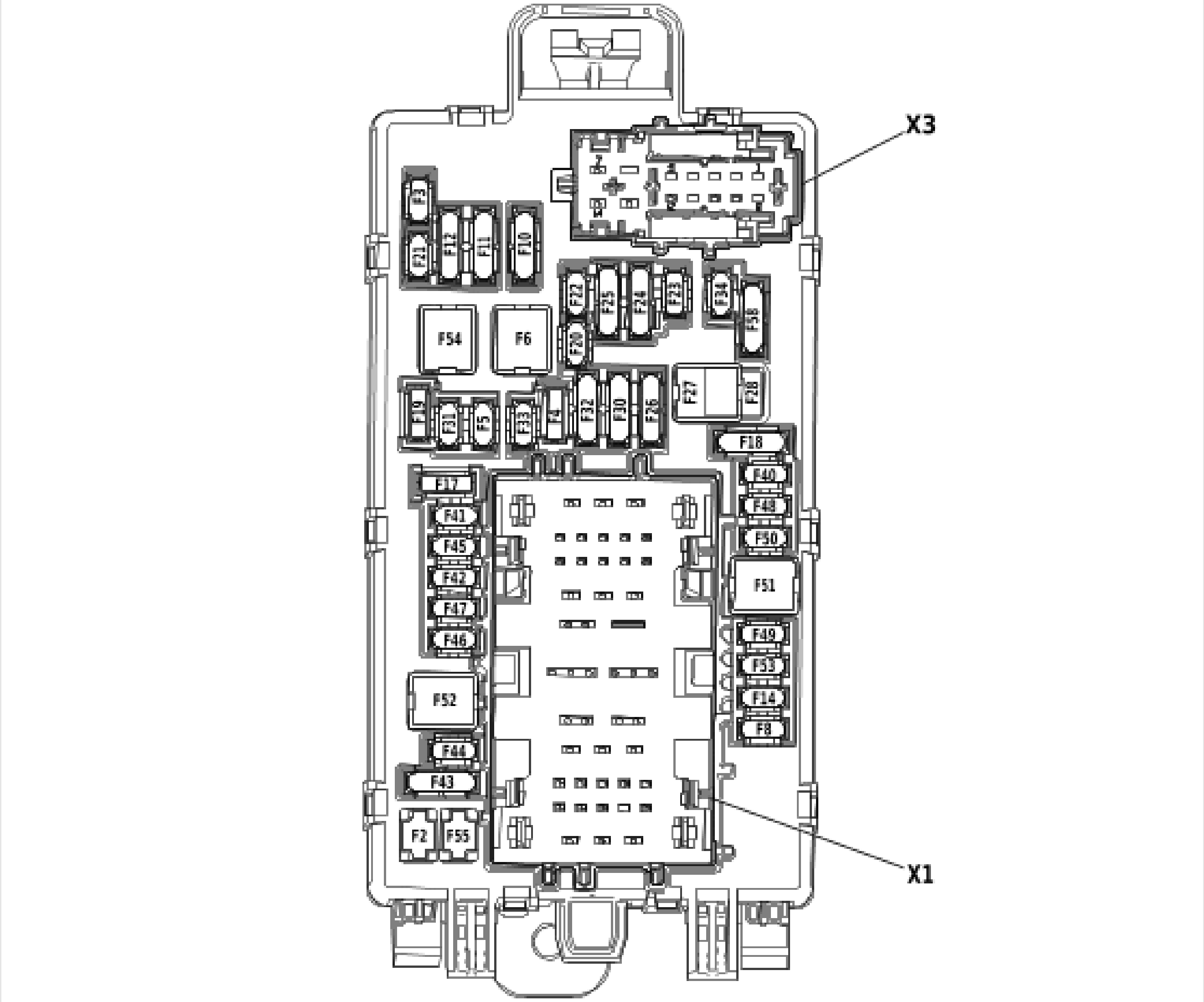
X51R Instrument Panel Wiring Harness Junction Block - Right Top View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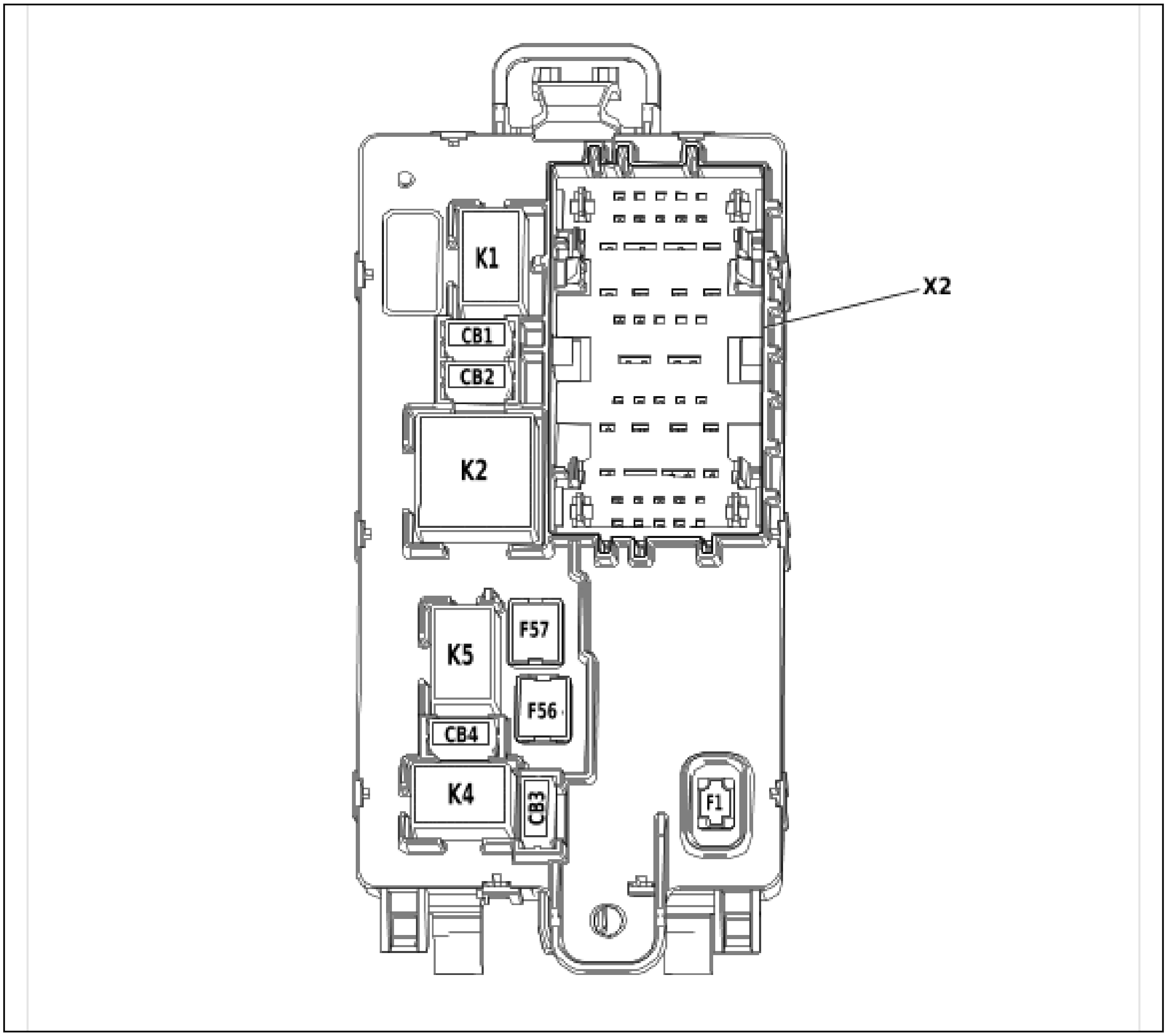
Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Circuit Breakers				
CB4	NOT USED	—	—	• Not Used
Fuses				
F1	RF RR WINDOW MTR	F1DR	30A	• M74P Front Side Door Window Regulator Motor - Passenger (AEF) • S79P Front Side Door Window Switch - Passenger (AED/AEF) • S79RR Rear Side Door Window Switch - Right

No.	Device Label Name	Device Assigned Name	Rating	Description
F2	LF LR WINDOW MTR	F2DR	30A	• M74D Front Side Door Window Regulator Motor - Driver • S79LR Rear Side Door Window Switch - Left
F3	NOT USED	F3DR	—	• Not Used
F4	ELM 2	F4DR	15A	• K219 Lighting Control Module
F5	ELM 3	F5DR	10A	• K219 Lighting Control Module
F6	FRT BLWR	F6DR	40A	• M8 Blower Motor
F8	LF WINDOW SWITCH	F8DR	15A	• S79D Front Side Door Window Control Switch - Driver • S32R Rear Seat Heater Switch (KA6)
F10	STR TILT/UVM	F10DR	15A	• K219 Lighting Control Module • K56U Special Purpose Vehicle Control Module
F11	VPM/OHC CAMERA	F11DR	10A	• A103 Roof Console • B174W Front View Camera - Windshield (UGN/UHY) • K157 Video Processing Module (UV2)
F12	CGM/TCP/COL LCK/DMS	F12DR	10A	• K56 Serial Data Gateway Module • K60 Column Lock Module • K73 Telematic Control Module (UE1)
F14	NOT USED	F14DR	—	• Not Used
F17	STR WHL CNTRL	F17DR	2A	• S70L Cruise Control Switch (KI3) • S70R Radio Control Switch - Steering Wheel (KI3)
F18	NOT USED	F18DR	—	• Not Used
F19	NOT USED	F19DR	—	• Not Used
F20	NOT USED	F20DR	—	• Not Used
F21	NOT USED	F21DR	—	• Not Used
F22	HTD WHL	F22DR	7.5A	• K32 Steering Wheel Heating Control Module (KI3)
F23	NOT USED	F23DR	—	• Not Used
F24	NOT USED	F24DR	—	• Not Used
F25	SPOT LAMP LT/RT	F25DR	15A	• Not Used
F26	SEO/USB CHARGE	F26DR	10A	• X92CD Dual Charge Only Receptacle - Floor Console Rear (D07+UBI) • X92FSR Dual Charge Only Receptacle - Front Center Seat Rear Cover (AZ3+UBI)
F27	APO/RAP	F27DR	50A	• Not Used
F28	APO/BATT	F28DR	50A	• Not Used
F30	SDM/AOS	F30DR	10A	• K85P Restraints Occupant Classification System Module - Passenger • P16 Instrument Panel Cluster Control Module • P29 Head-Up Display • A22 Radio Control • A26 Heater and Air Conditioning User Interface Control - Front • B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor
F31	BCM 3	F31DR	20A	• K9 Body Control Module

No.	Device Label Name	Device Assigned Name	Rating	Description
F32	RFA WCM AUX JACK/CSM AUX JACK/TBCS	F32DR	15A	• A11 Radio (IOK) • S76 Trailer Brake Control Switch • T22 Wireless Accessory Charging Module (K4C) • X83B Audio/Video Receptacle (D07) • X92IP USB 2 Port Receptacle - Instrument Panel (d07) • X92CF USB 2 Port Receptacle - Floor Console Front (UBD)
F33	BCM 4	F33DR	30A	• K9 Body Control Module
F34	NOT USED	F34DR	—	• Not Used
F40	NOT USED	F40DR	—	• Not Used
F41	NOT USED	F41DR	—	• Not Used
F42	EPBS	F42DR	10A	• S91 Parking Brake Control Switch
F43	NOT USED	F43DR	—	• Not Used
F44	SIB	F44DR	10A	• Not Used
F45	RADIO LO	F45DR	15A	• A11 Radio (IOR)
F46	NOT USED	F46DR	—	• Not Used

X51R Instrument Panel Wiring Harness Junction Block - Right Bottom View



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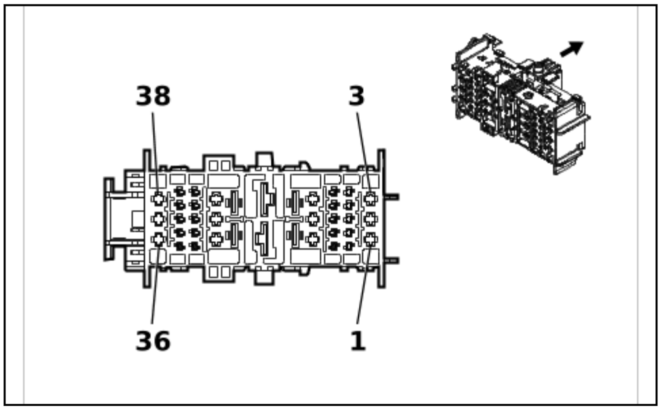
Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Circuit Breakers				
CB1	APO 1	CB1DR	15A	• X80G Accessory Power Receptacle - Instrument Panel (KC5)
CB2	NOT USED	—	—	• Not Used
Fuses				
F47	NOT USED	F47DR	—	• Not Used
F48	TCM	F48DR	20A	• K71 Transmission Control Module
F49	BCM 1	F49DR	15A	• K9 Body Control Module
F50	NOT USED	F50DR	—	• Not Used

No.	Device Label Name	Device Assigned Name	Rating	Description
F51	BATT 1	F51DR	40A	• Not Used
F52	BATT 2	F52DR	40A	• Not Used
F53	NOT USED	F53DR	—	• Not Used
F54	SUNROOF	F54DR	40A	• K61 Sunroof Control Module (CF5)
F55	DRVR PWR SEAT	F55DR	30A	• K40D Driver Seat Adjuster Memory Module (A45) • S64D Front Seat Adjuster Switch - Driver (-A45)
F56	DC/DC CONVERTER BATT 1	F56DR	40A	• Not Used
F57	DC/DC CONVERTER BATT 2	F57DR	40A	• Not Used
F58	NOT USED	F58DR	—	• Not Used
F59	NOT USED	F59DR	—	• Not Used
Relays				
K1	NOT USED	—	—	• Not Used
K2	RAP/ACCY 1	KR76 Accessory Time Delay Cutoff Relay	—	• CB1DR • F26DR
K4	NOT USED	—	—	• Not Used
K5	NOT USED	—	—	• Not Used

X51R Instrument Panel Wiring Harness Junction Block - Right X1



5402140

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35729471
- Service Connector: 85791494
- Description: 38-Way F 1.5, 2.8, 6.3 MCP, 9.5 MCON-LL Series(BU)

Terminal Part Information

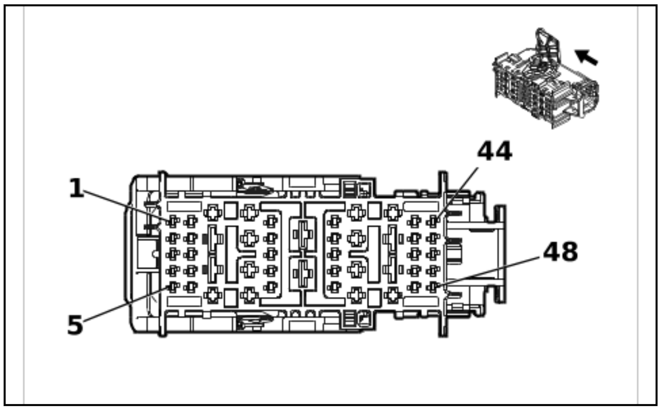
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19332366	J-35616-35 (VT)	J-38125-212
II	19371175	J-35616-2A (GY)	EL-38125-560A

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
III	84764079	J-35616-22 (RD)	J-38125-11A
IV	Not required	J-35616-22 (RD)	No Tool Required

X51R Instrument Panel Wiring Harness Junction Block - Right X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) RD / GN	(3) 1840	(3) Battery Positive Voltage	(3) I	(3) —
(4) 4	(4) 0.75	(4) RD / VT	(4) 2640	(4) Battery Positive Voltage	(4) II	(4) —
(5) 5	(5) 0.5	(5) RD / GN	(5) 4440	(5) Battery Positive Voltage	(5) II	(5) —
(6) 6	(6) 0.35	(6) VT	(6) 4701	(6) Retained Accessory Power Control	(6) II	(6) —
7 - 13	—	—	—	Not Occupied	—	—
(14) 14	(14) 0.5	(14) RD / VT	(14) 1640	(14) Battery Positive Voltage	(14) I	(14) —
15 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 5	(19) RD / YE	(19) 1442	(19) Battery Positive Voltage	(19) III	(19) —
(20) 20	(20) 10	(20) RD / WH	(20) 342	(20) Battery Positive Voltage	(20) IV	(20) —
21 - 22	—	—	—	Not Occupied	—	—
(23) 23	(23) 2.5	(23) RD / GY	(23) 4840	(23) Battery Positive Voltage	(23) I	(23) —
(24) 24	(24) 2.5	(24) RD / BN	(24) 4240	(24) Battery Positive Voltage	(24) I	(24) —
(25) 25	(25) 2.5	(25) RD / BU	(25) 3240	(25) Battery Positive Voltage	(25) I	(25) —
26 - 29	—	—	—	Not Occupied	—	—
(30) 30	(30) 0.5	(30) RD / BU	(30) 1240	(30) Battery Positive Voltage	(30) II	(30) —
31 - 35	—	—	—	Not Occupied	—	—
(36) 36	(36) 2.5	(36) RD / YE	(36) 5040	(36) Battery Positive Voltage	(36) I	(36) —
(37) 37	(37) 2.5	(37) RD / GY	(37) 3540	(37) Battery Positive Voltage	(37) I	(37) —
38	—	—	—	Not Occupied	—	—

X51R Instrument Panel Wiring Harness Junction Block - Right X2



5403539

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35264616
- Service Connector: 19371180
- Description: 48-Way F 1.5, 2.8, 6.3 CTS Series(GN)

Terminal Part Information

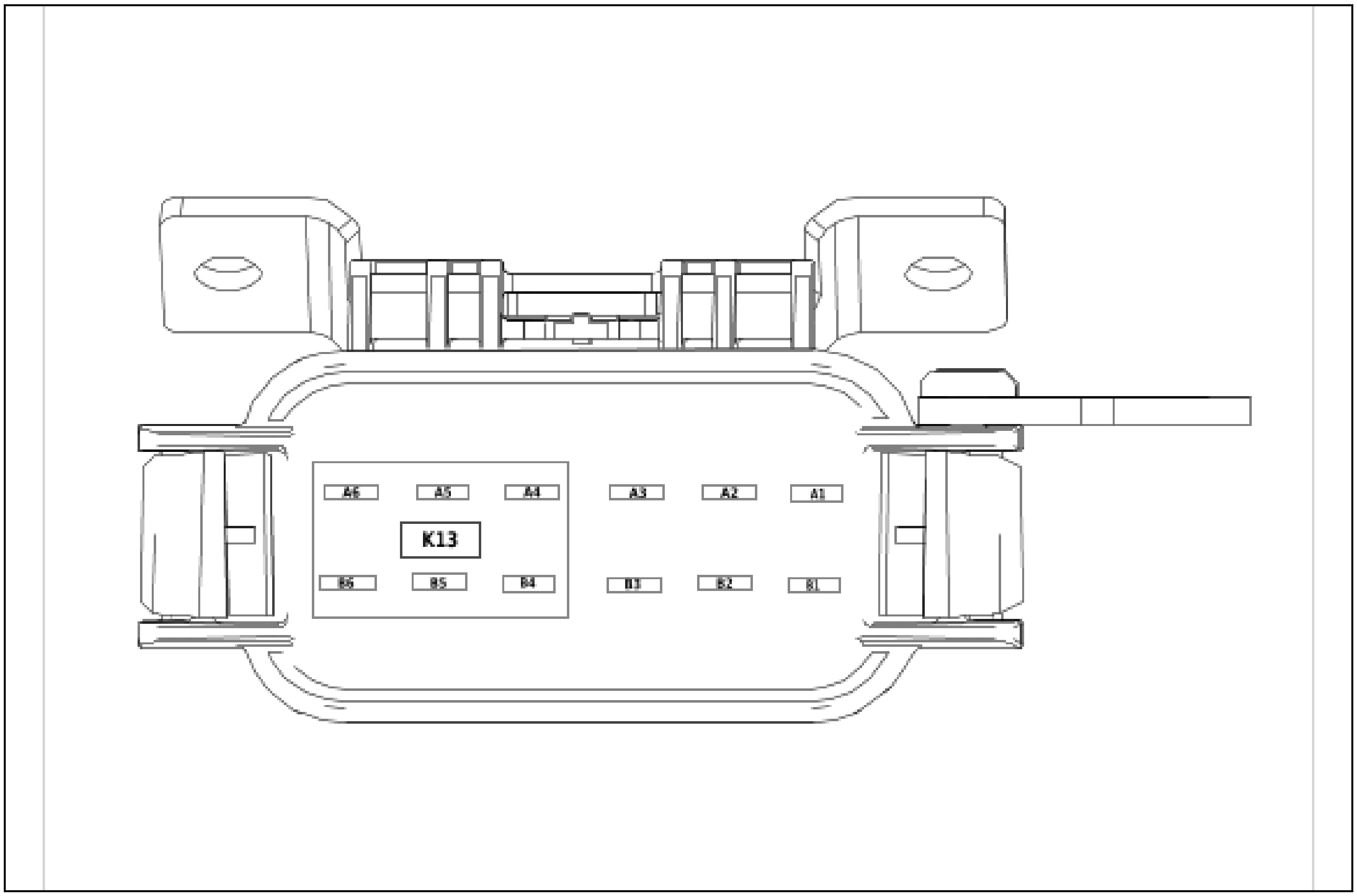
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19369711	J-35616-14 (GN)	J-38125-557
II	84764078	J-35616-42 (RD)	J-38125-221
III	84779405	J-35616-35 (VT)	J-38125-212

X51R Instrument Panel Wiring Harness Junction Block - Right X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) GY / GN	(3) 4083	(3) Retained Accessory Power Relay 2 Coil Control	(3) I	(3) —
4 - 7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.5	(8) RD / GN	(8) 7740	(8) Battery Positive Voltage	(8) I	(8) —
(9) 9	(9) 0.5	(9) RD / YE	(9) 240	(9) Battery Positive Voltage	(9) I	(9) —
10 - 13	—	—	—	Not Occupied	—	—
(14) 14	(14) 0.5	(14) RD / YE	(14) 3040	(14) Battery Positive Voltage	(14) III	(14) —
(15) 15	(15) 0.5	(15) RD / BN	(15) 10040	(15) Battery Positive Voltage	(15) III	(15) —
(16) 16	(16) 0.75	(16) RD / VT	(16) 4640	(16) Battery Positive Voltage	(16) III	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.35	(18) RD / VT	(18) 3340	(18) Battery Positive Voltage	(18) III	(18) —
19 - 23	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(24) 24	(24) 4	(24) RD / GY	(24) 1740	(24) Battery Positive Voltage	(24) II	(24) —
(25) 25	(25) 2.5	(25) RD / BU	(25) 4540	(25) Battery Positive Voltage	(25) II	(25) —
26	—	—	—	Not Occupied	—	—
(27) 27	(27) 0.5	(27) RD / YE	(27) 2340	(27) Battery Positive Voltage	(27) I	(27) —
(28) 28	(28) 0.5	(28) RD / WH	(28) 1340	(28) Battery Positive Voltage	(28) I	(28) —
29 - 30	—	—	—	Not Occupied	—	—
(31) 31	(31) 1.5	(31) VT	(31) 1001	(31) Retained Accessory Power Ignition Voltage	(31) III	(31) —
(32) 32	(32) 2	(32) RD / BU	(32) 2540	(32) Battery Positive Voltage	(32) III	(32) —
(33) 33	(33) 0.5	(33) RD / VT	(33) 7140	(33) Battery Positive Voltage	(33) III	(33) —
(34) 34	(34) 1	(34) RD / GY	(34) 2140	(34) Battery Positive Voltage	(34) III	(34) —
(35) 35	(35) 0.5	(35) RD / GN	(35) 1540	(35) Battery Positive Voltage	(35) III	(35) —
36	—	—	—	Not Occupied	—	—
(37) 37	(37) 1	(37) RD / GY	(37) 2840	(37) Battery Positive Voltage	(37) II	(37) —
38 - 40	—	—	—	Not Occupied	—	—
(41) 41	(41) 0.35	(41) RD / GN	(41) 5140	(41) Battery Positive Voltage	(41) I	(41) —
(42) 42	(42) 0.35	(42) RD / YE	(42) 4340	(42) Battery Positive Voltage	(42) I	(42) —
43 - 44	—	—	—	Not Occupied	—	—
(45) 45	(45) 0.5	(45) RD / WH	(45) 2740	(45) Battery Positive Voltage	(45) I	(45) —
46 - 48	—	—	—	Not Occupied	—	—

X54 Accessory Wiring Junction Block - Snow Plow Top View (VYU)

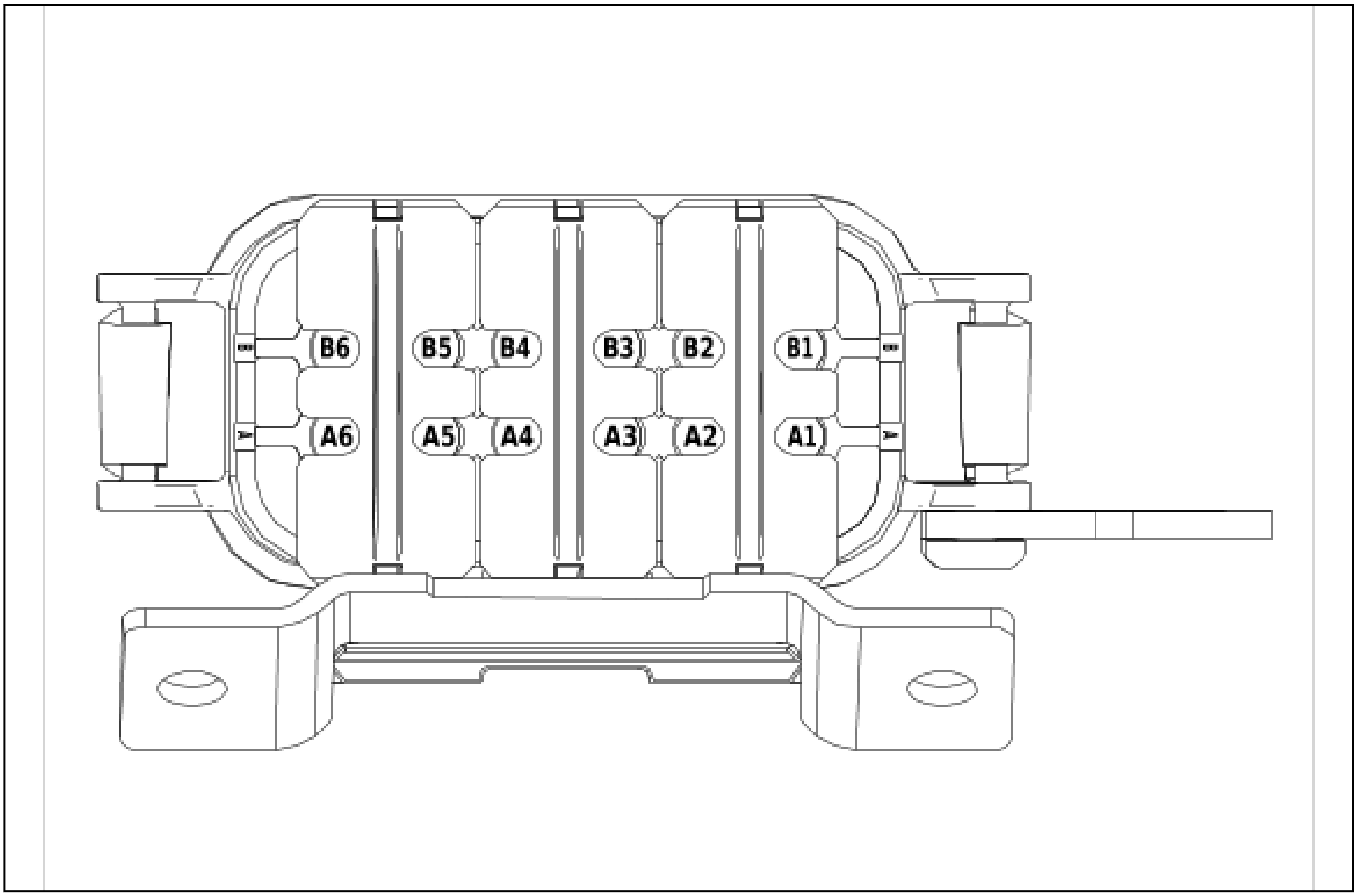


6471250

Usage Table

No.	Device Label Name	Device Assigned Name	Rating	Description
Relays				
K13	—	KR181 Snow Plow Relay	—	• G13 Generator • G13A Auxiliary Generator

X54 Accessory Wiring Junction Block - Snow Plow Wire Entry View (VYU)



6470466

Connector Part Information
- Harness Type: Accessory Wiring Harness
- OEM Connector: 35028846
- Service Connector: Service by Component Assembly - See Part Catalog
- Description: Wire Entry Fuse Block

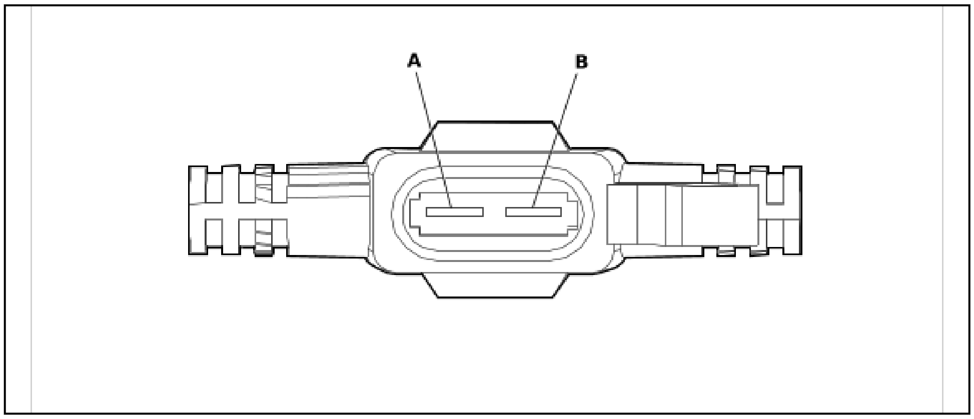
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

X54 Accessory Wiring Junction Block - Snow Plow Wire Entry View (VYU)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A4	0.5	BN	25	Charge Indicator Control	I	—
A6	0.75	GY / VT	9026	—	I	—
B4	0.75	BN	25	Charge Indicator Control	I	—
B5	0.5	BN	25	Charge Indicator Control	I	—

X55SP Wiring Harness Fuse Holder - Snow Plow



6465868

Connector Part Information
- Harness Type: Accessory Wiring Harness
- OEM Connector: 13788151
- Service Connector: Service by Component Assembly - See Part Catalog
- Description: Wire Entry Fuse Block

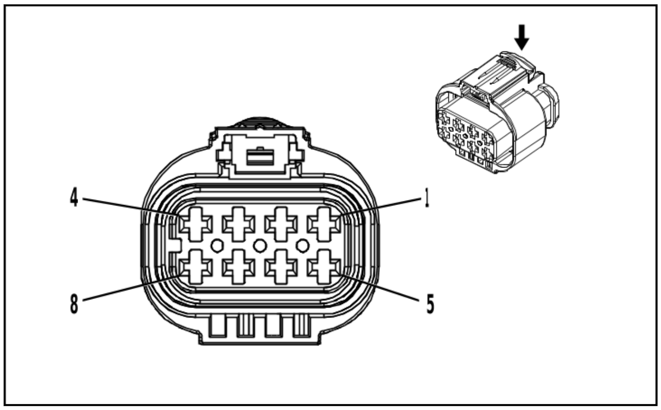
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

X55SP Wiring Harness Fuse Holder - Snow Plow

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	1	OG	9026	—	I	—
B	1	BARE	9028	—	I	—

A7 Fuel Tank Fuel Pump Module



3749582

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 2-2109441-5
- Service Connector: 19354078
- Description: 8-Way F 2.8 Series, Sealed(L-GY)

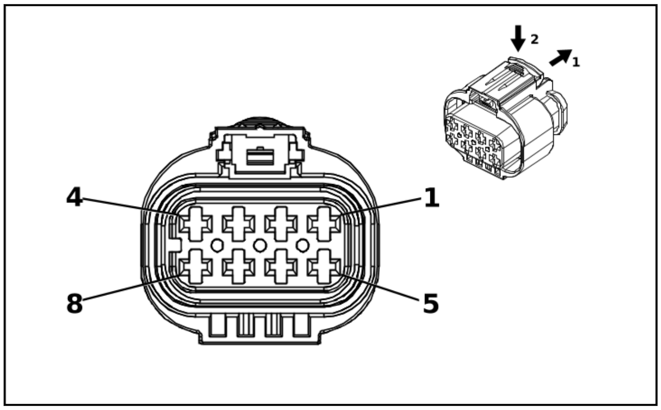
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

A7 Fuel Tank Fuel Pump Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY	(1) 120	(1) Fuel Pump Control	(1) I	(1) —
(2) 2	(2) 2.5	(2) YE / GY	(2) 4137	(2) Fuel Pump Supply Voltage Phase 2	(2) I	(2) —
(3) 3	(3) 2.5	(3) WH / BN	(3) 4138	(3) Fuel Pump Supply Voltage Phase 3	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 7444	(4) Fuel Pump Assembly Shield Ground	(4) II	(4) —
(5) 5	(5) 0.5 (5) 0.75	(5) BU / GN (5) BU / GN	(5) 1936 (5) 1936	(5) Primary Fuel Level Sensor Signal (5) Primary Fuel Level Sensor Signal	(5) II (5) II	(5) — (5) —
(6) 6	(6) 0.5	(6) BK / GN	(6) 6281	(6) Fuel Level Sensor Low Reference	(6) II	(6) —
7 - 8	—	—	—	Not Occupied	—	—

A7AX Fuel Tank Fuel Pump Module - Auxiliary (L5P)



3749581

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 2109441-4
- Service Connector: 19355165
- Description: 8-Way F 2.8 Series, Sealed(BK)

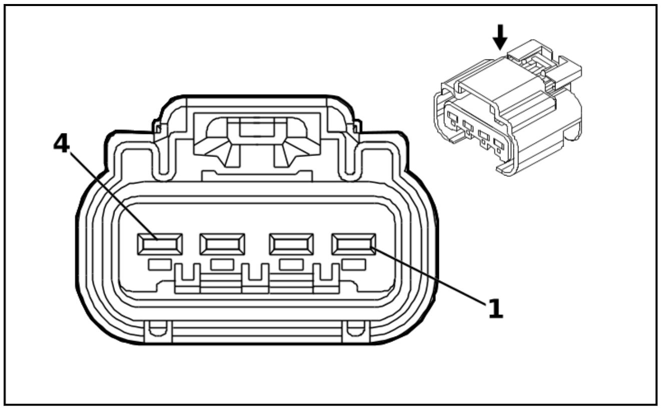
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

A7AX Fuel Tank Fuel Pump Module - Auxiliary (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) BU / WH	(5) 1937	(5) Secondary Fuel Level Sensor Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) BK / BU	(6) 6282	(6) Fuel Level Sensor 2 Low Reference	(6) I	(6) —
7 - 8	—	—	—	Not Occupied	—	—

A7AX Fuel Tank Fuel Pump Module - Auxiliary (L8T)



5199377

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 13843236
- Service Connector: 84769204
- Description: 4-Way F 280 GT Series, Sealed(NA)

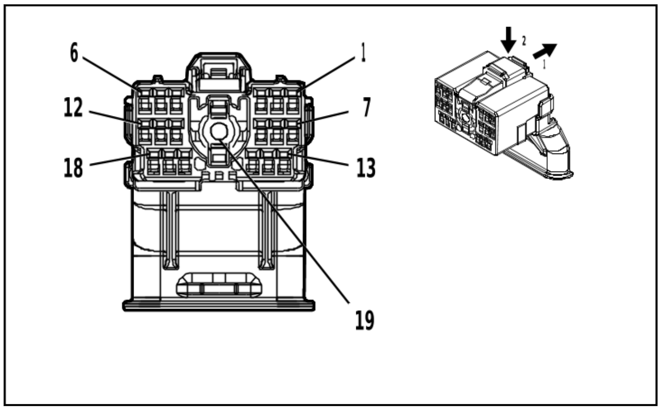
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

A7AX Fuel Tank Fuel Pump Module - Auxiliary (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) BU / GN	(1) 2120	(1) Secondary Fuel Pump Control	(1) I	(1) —
(2) 2	(2) 1	(2) BK / GN	(2) 1580	(2) Fuel Pump Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / WH	(3) 1937	(3) Secondary Fuel Level Sensor Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / BU	(4) 6282	(4) Fuel Level Sensor 2 Low Reference	(4) I	(4) —

A9A Outside Rearview Mirror - Driver X1



4991775

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: 6098-8388
- Service Connector: Service by Harness - See Part Catalog
- Description: 19-Way F 1.2 MCON, Coaxial Series(BK)

Terminal Part Information

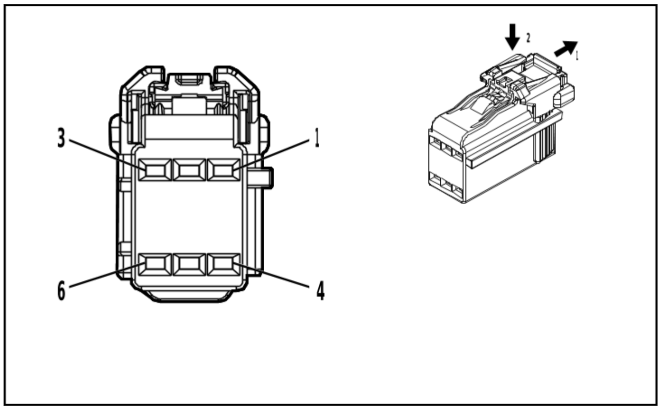
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required
III	Service by Cable	No Tool Required	No Tool Required

A9A Outside Rearview Mirror - Driver X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / BK	(1) 2790	(1) Left Front Mirror Motor Right [+] Left [-] Control	(1) II	(1) —
(2) 2	(2) 0.5	(2) VT / BU	(2) 2788	(2) Left Front Mirror Motor Up [+] Down [-] Control	(2) II	(2) —
(3) 3	(3) 0.5	(3) WH / GN	(3) 2786	(3) Left Front Mirror Motor Fold In Control	(3) II	(3) —
(4) 4	(4) 0.5	(4) GY / YE	(4) 1760	(4) Left Side Object Detection LED Control	(4) II	(4) —
(5) 5	(5) 0.5	(5) WH / GN	(5) 5966	(5) Approach Lamp Control	(5) II	(5) —
(6) 6	(6) 0.5	(6) BN / GN	(6) 4246	(6) Identification Lamp Control	(6) II	(6) —
(7) 7	(7) 0.5	(7) WH	(7) 606	(7) Left Outside Rearview Mirror Heater Control	(7) II	(7) —
(8) 8	(8) 0.5	(8) WH / GY	(8) 2114	(8) Left Turn Signal Lamp Control 2	(8) II	(8) —
(9) 9	(9) 0.5	(9) BK	(9) 1550	(9) Ground	(9) II	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) YE / GY	(11) 2933	(11) Task Lamp Control Left	(11) I	(11) —
(12) 12	(12) 0.5	(12) BK / YE	(12) 1691	(12) Automatic Day/Night Mirror Low Reference	(12) II	(12) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(13) 13	(13) 0.5	(13) BU / YE	(13) 7761	(13) Backup Illumination Lamp Control	(13) II	(13) —
(14) 14	(14) 0.5	(14) YE / BN	(14) 2789	(14) Left Front Mirror Motor Common Control	(14) II	(14) —
(15) 15	(15) 0.5	(15) GY / WH	(15) 2785	(15) Left Front Mirror Motor Fold Out Control	(15) II	(15) —
16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.5	(17) YE / WH	(17) 1690	(17) Mirror Dimming Signal	(17) II	(17) —
18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0	(19) Coax Cable	(19) 4725	(19) Left Sideview Camera LVDS (Low Voltage Differential Signaling) Coaxial Signal	(19) III	(19) —

A9A Outside Rearview Mirror - Driver X2



4862126

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: 6098-8996
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 1.2 Series(BK)

Terminal Part Information

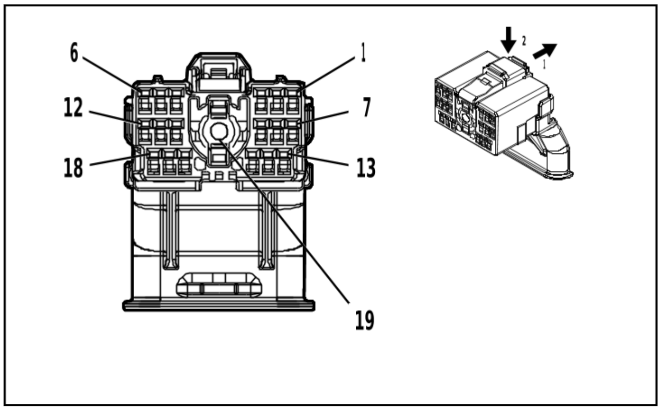
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

A9A Outside Rearview Mirror - Driver X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / YE	(1) 2792	(1) Left Front Mirror Position Sensor Left [-] Right [+] Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / RD	(2) 2791	(2) Left Front Mirror Position Sensor High Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) GY / BN	(3) 2787	(3) Left Front Mirror Position Sensor Up [+] Down [-] Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / BN	(4) 673	(4) Left Outside Rearview Mirror Position Sensor Low Reference	(4) I	(4) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(5) 5	(5) 0.5	(5) BN	(5) 10201	(5) Left Front Mirror Motor Extend Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) WH / BK	(6) 10202	(6) Left Front Mirror Motor Retract Control	(6) I	(6) —

A9B Outside Rearview Mirror - Passenger X1



4991775

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 6098-8388
- Service Connector: Service by Harness - See Part Catalog
- Description: 19-Way F 1.2 MCON, Coaxial Series(BK)

Terminal Part Information

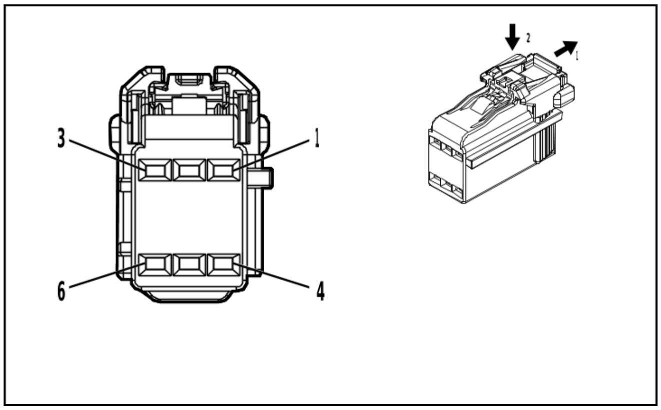
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required
III	Service by Cable	No Tool Required	No Tool Required

A9B Outside Rearview Mirror - Passenger X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / BK	(1) 2798	(1) Right Front Mirror Motor Right [+] Left [-] Control	(1) II	(1) —
(2) 2	(2) 0.5	(2) YE / VT	(2) 2796	(2) Right Front Mirror Motor Up [+] Down [-] Control	(2) II	(2) —
(3) 3	(3) 0.5	(3) BU / GY	(3) 2794	(3) Right Front Mirror Motor Fold In Control	(3) II	(3) —
(4) 4	(4) 0.5	(4) GY	(4) 1761	(4) Right Side Object Detection LED Control	(4) II	(4) —
(5) 5	(5) 0.5	(5) WH / GN	(5) 5966	(5) Approach Lamp Control	(5) II	(5) —
(6) 6	(6) 0.5	(6) BN / GN	(6) 4246	(6) Identification Lamp Control	(6) II	(6) —
(7) 7	(7) 0.5	(7) BN / VT	(7) 607	(7) Right Outside Rearview Mirror Heater Control	(7) II	(7) —
(8) 8	(8) 0.5	(8) GN / GY	(8) 2115	(8) Right Turn Signal Lamp Control 2	(8) II	(8) —
(9) 9	(9) 0.75	(9) BK	(9) 1350	(9) Ground	(9) II	(9) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(10) 10	(10) 0.5	(10) BU / GY	(10) 636	(10) Ambient Air Temperature Sensor Signal	(10) II	(10) —
(11) 11	(11) 0.35	(11) YE / WH	(11) 2934	(11) Task Lamp Control Right	(11) I	(11) —
(12) 12	(12) 0.5	(12) BK / YE	(12) 1691	(12) Automatic Day/Night Mirror Low Reference	(12) II	(12) —
(13) 13	(13) 0.5	(13) BU / YE	(13) 7761	(13) Backup Illumination Lamp Control	(13) II	(13) —
(14) 14	(14) 0.5	(14) WH	(14) 2797	(14) Right Front Mirror Motor Common Control	(14) II	(14) —
(15) 15	(15) 0.5	(15) YE / WH	(15) 2793	(15) Right Front Mirror Motor Fold Out Control	(15) II	(15) —
16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.5	(17) YE / WH	(17) 1690	(17) Mirror Dimming Signal	(17) II	(17) —
(18) 18	(18) 0.5	(18) BK / GY	(18) 626	(18) Engine Control Vehicle Sensors Low Reference 1	(18) II	(18) —
(19) 19	(19) 0	(19) Coax Cable	(19) 4724	(19) Right Sideview Camera LVDS (Low Voltage Differential Signaling) Coaxial Signal	(19) III	(19) —

A9B Outside Rearview Mirror - Passenger X2



4862126

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 6098-8996
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 1.2 Series(BK)

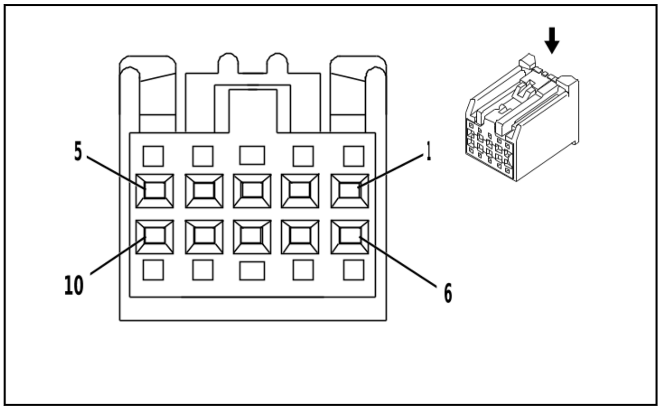
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

A9B Outside Rearview Mirror - Passenger X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / WH	(1) 2800	(1) Right Front Mirror Position Sensor Left [-] Right [+] Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / RD	(2) 2799	(2) Right Front Mirror Position Sensor High Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / YE	(3) 2795	(3) Right Front Mirror Position Sensor Up [+] Down [-] Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / GN	(4) 675	(4) Right Outside Rearview Mirror Position Sensor Low Reference	(4) I	(4) —
(5) 5	(5) 0.5	(5) BN / GN	(5) 10203	(5) Right Front Mirror Motor Extend Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) VT	(6) 10204	(6) Right Front Mirror Motor Retract Control	(6) I	(6) —

A10 Inside Rearview Mirror X1



2180211

Connector Part Information

- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: AIT2PB-10P-2AK
- Service Connector: 13577390
- Description: 10-Way F 0.64 Kaizen Series(BK)

Terminal Part Information

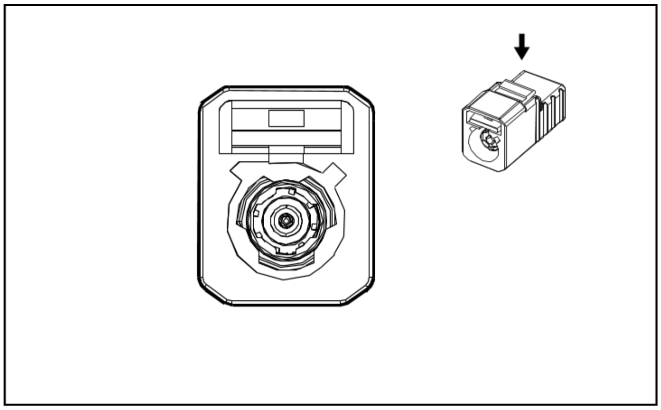
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13575742	J-35616-64B (L-BU)	J-38125-215A

A10 Inside Rearview Mirror X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN / WH	(1) 24	(1) Backup Lamp Control	(1) I	(1) —
(2) 2	(2) 0.5 (2) 0.35	(2) VT / BK (2) VT / BK	(2) 339 (2) 339	(2) Run/Crank Ignition 1 Voltage (2) Run/Crank Ignition 1 Voltage	(2) I (2) I	(2) DD8/ DRZ (2) UVO
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) BK / WH	(5) 851	(5) Signal Ground	(5) I	(5) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(6) 6	(6) 0.35	(6) GY / YE	(6) 6972	(6) Rearview Camera Signal [+]	(6) I	(6) —
(7) 7	(7) 0.35	(7) WH / BU	(7) 6973	(7) Rearview Camera Signal [-]	(7) I	(7) —
(8) 8	(8) 0.35	(8) BK / YE	(8) 1691	(8) Automatic Day/Night Mirror Low Reference	(8) I	(8) —
(9) 9	(9) 0.35	(9) YE / WH	(9) 1690	(9) Mirror Dimming Signal	(9) I	(9) —
10	—	—	—	Not Occupied	—	—

A10 Inside Rearview Mirror X2 (DRZ)



5331855

Connector Part Information

- Harness Type: Radio Antenna Cable Extension Cable COAX
- OEM Connector: 13581682
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

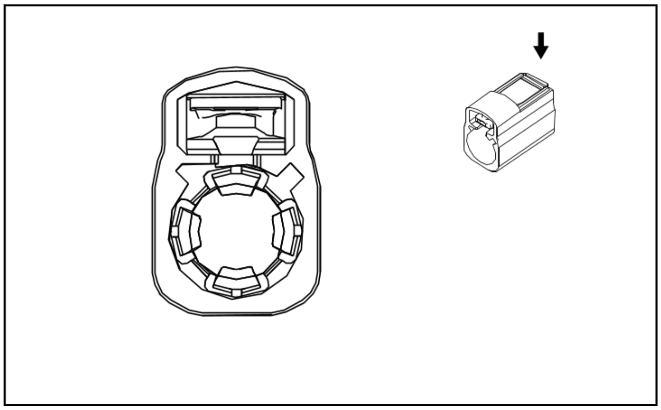
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A10 Inside Rearview Mirror X2 (DRZ)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
BK	— —	Coax Cable —	2387 Coax Cable	Full Display Mirror Rear Camera LVDS (Low Voltage Differential Signaling) Coaxial Signal Coax Cable	I I	— —
Coax Cable	—	—	—	Not Occupied	—	—

A11 Radio X1 (IOK)



2908476

Connector Part Information

- Harness Type: Radio Antenna Cable Extension Cable COAX
- OEM Connector: 12784257
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

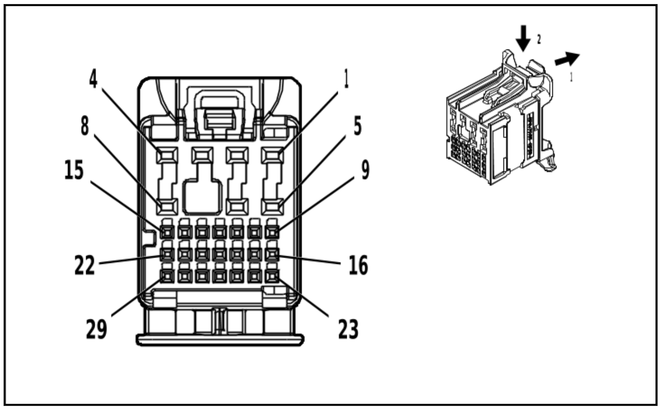
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X1 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(AM/FM) Antenna RF Signal	I	—

A11 Radio X1 (IOR)



4584346

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160014-0012
- Service Connector: 13534972
- Description: 29-Way F 0.5 NANO, 1.2 MCON Series(GN)

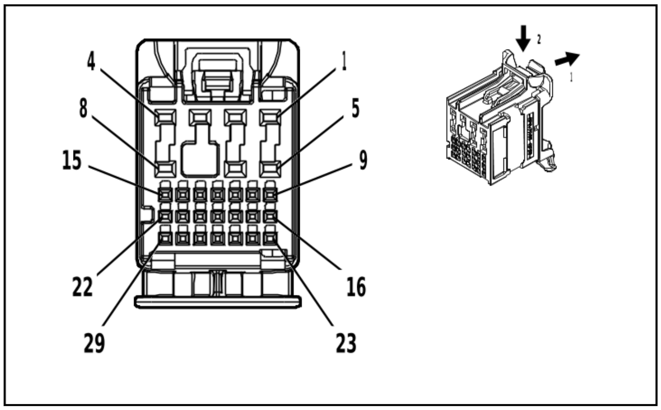
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

A11 Radio X1 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) RD / GY	(1) 2840	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.75	(2) RD / GY	(2) 2840	(2) Battery Positive Voltage	(2) I	(2) —
(3) 3	(3) 0.75	(3) BK / WH	(3) 1051	(3) Signal Ground	(3) I	(3) —
(4) 4	(4) 0.35	(4) BU / RD	(4) 11246	(4) Infotainment Display 5 Volt Reference	(4) I	(4) —
(5) 5	(5) 0.35	(5) BK / WH	(5) 11252	(5) Infotainment Display Low Reference	(5) I	(5) —
(6) 6	(6) 0.75	(6) BK / WH	(6) 1051	(6) Signal Ground	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.75	(8) GN / BK	(8) 116	(8) Left Rear Speaker [-] Control	(8) I	(8) —
(9) 9	(9) 0.35	(9) GY / BU	(9) 11247	(9) Infotainment Display LCD Enable Signal	(9) I	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) GN / WH	(11) 24	(11) Backup Lamp Control	(11) I	(11) —
12 - 14	—	—	—	Not Occupied	—	—
(15) 15	(15) 0.35	(15) BU / GY	(15) 11244	(15) Radio Switch Dimming Control	(15) I	(15) —
16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.35	(17) BU / WH	(17) 4985	(17) AUTOSAR CAN Bus [+] 5 Serial Data	(17) I	(17) —
(18) 18	(18) 0.35	(18) BU / YE	(18) 4984	(18) AUTOSAR CAN Bus [-] 5 Serial Data	(18) I	(18) —
19 - 20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.35	(21) GY / VT	(21) 11249	(21) Infotainment Display Backlight Enable Control	(21) I	(21) —
(22) 22	(22) 0.35	(22) BU / GN	(22) 11248	(22) Infotainment Display Backlight Dimming Control	(22) I	(22) —
23	—	—	—	Not Occupied	—	—
(24) 24	(24) 0.35	(24) BN / WH	(24) 11233	(24) Radio Switch Power ON/OFF Switch Signal	(24) I	(24) —
(25) 25	(25) 0.35	(25) VT / WH	(25) 11245	(25) Radio Switch Buttons Signal	(25) I	(25) —
(26) 26	(26) 0.35	(26) BU	(26) 11235	(26) Radio Switch Volume Up Signal	(26) I	(26) —
(27) 27	(27) 0.35	(27) GY / BN	(27) 11234	(27) Radio Switch Volume Down Signal	(27) I	(27) —
28 - 29	—	—	—	Not Occupied	—	—

A11 Radio X2 (IOR)



4584398

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160014-0013
- Service Connector: 13534973
- Description: 29-Way F 0.5 NANO, 1.2 MCON, stAK50h Series(LT GY with GY Inner Connector)

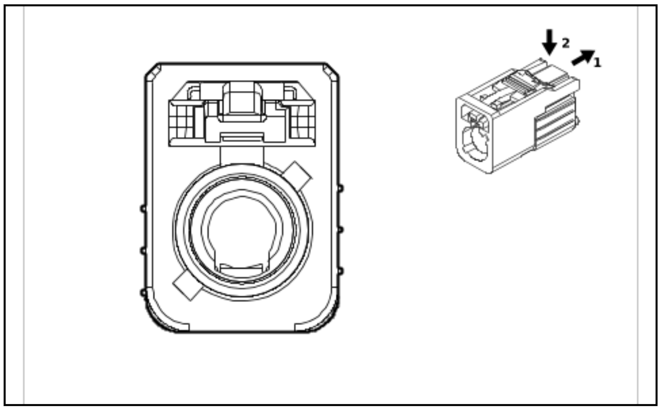
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

A11 Radio X2 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN	(1) 199	(1) Left Rear Speaker [+] Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) BU	(2) 201	(2) Left Front Speaker 1 [+] Control	(2) I	(2) —
(3) 3	(3) 0.75	(3) YE	(3) 200	(3) Right Front Speaker 1 [+] Control	(3) I	(3) —
(4) 4	(4) 0.75	(4) BU / BK	(4) 115	(4) Right Rear Speaker [-] Control	(4) I	(4) —
(5) 5	(5) 0.75	(5) BN / BU	(5) 118	(5) Left Front Speaker [-] Control 1	(5) I	(5) —
(6) 6	(6) 0.75	(6) YE / BK	(6) 117	(6) Right Front Speaker [-] Control 1	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.75	(8) WH	(8) 46	(8) Right Rear Speaker [+] Control	(8) I	(8) —
(9) 9	(9) 0.35	(9) BK / GY	(9) 5152	(9) Voice Recognition Audio [-] Control	(9) I	(9) —
(10) 10	(10) 0.35	(10) GY / YE	(10) 5149	(10) Voice Recognition Audio Signal	(10) I	(10) —
11 - 29	—	—	—	Not Occupied	—	—

A11 Radio X2 (IOK)



5793980

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340311
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BU)

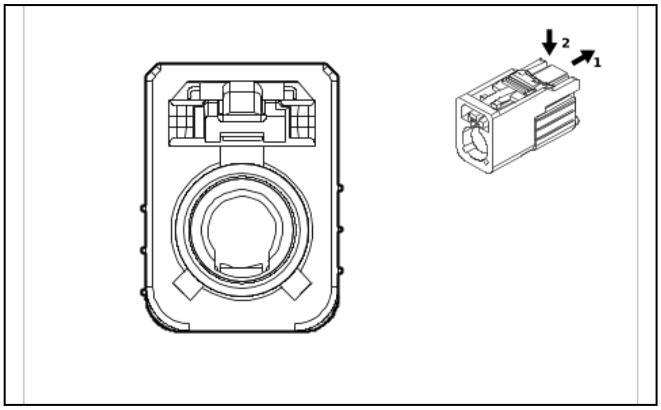
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X2 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(GPS only) Coaxial Antenna GPS Signal	I	—

A11 Radio X3 (IOK)



5794617

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340318
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(CU)

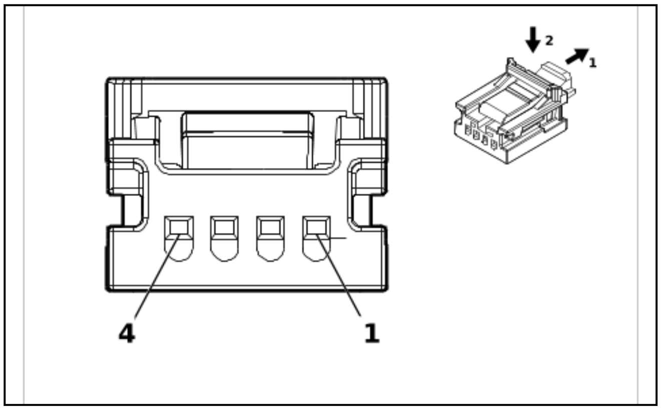
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X3 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(XM +/-HD) Coaxial Antenna XM Signal	I	—

A11 Radio X3 (IOR)



5493278

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 34791-5140
- Service Connector: 19354840
- Description: 4-Way F Mini 50 Series(BK)

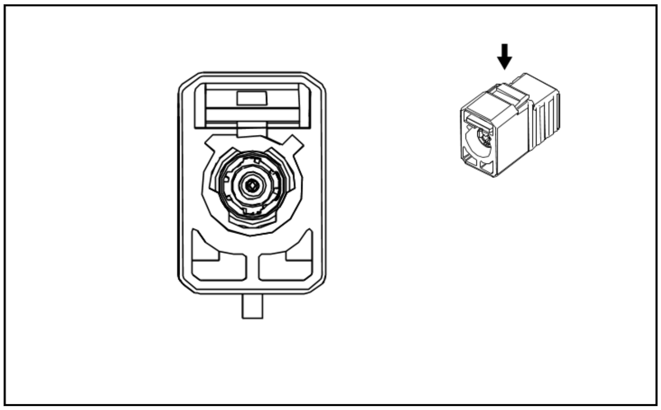
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Service by Cable	EL-35616-58 (BK)	EL-38125-58

A11 Radio X3 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.35	(2) YE	(2) 4758	(2) Ethernet Bus 2 [+]	(2) I	(2) —
(3) 3	(3) 0.35	(3) BU	(3) 4757	(3) Ethernet Bus 2 [-]	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

A11 Radio X4 (IOK)



2893647

Connector Part Information

- Harness Type: Radio Antenna Cable Extension Cable COAX
- OEM Connector: 3FA1-NASJ-C01W0
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

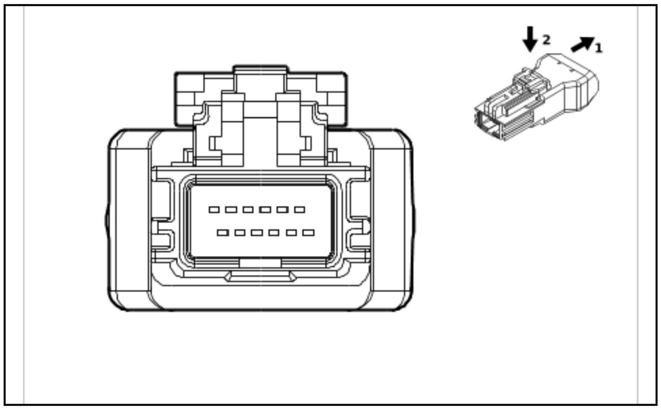
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X4 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(DAB/DMB) Coaxial Antenna DAB Signal	I	—

A11 Radio X4 (IOR)



6410264

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness LVDS
- OEM Connector: 111146-3000
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 12-Way M 2.0 HSAL-2 Series(BK)

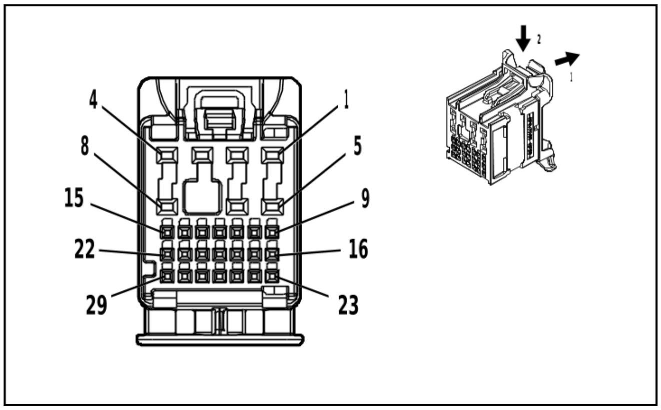
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X4 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	LVDS	—	Center Stack LVDS (Low Voltage Differential Signaling) Low Reference	I	—

A11 Radio X5 (IOK)



4496253

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160014-0014
- Service Connector: 13534974
- Description: 29-Way F 0.5 NANO, 1.2 MCON, stAK50h Series(BK with GY Inner Connector)

Terminal Part Information

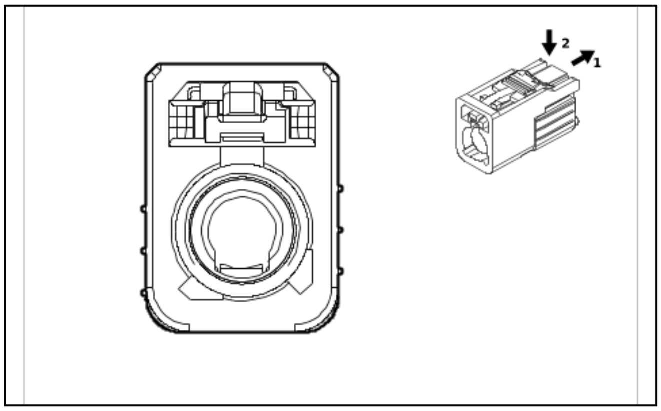
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

A11 Radio X5 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / YE	(1) 2340	(1) Battery Positive Voltage	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.75	(3) BK / WH	(3) 1051	(3) Signal Ground	(3) I	(3) —
4 - 7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.75	(8) GN / BK	(8) 116	(8) Left Rear Speaker [-] Control	(8) I	(8) —
(9) 9	(9) 0.35	(9) GY / YE	(9) 5149	(9) Voice Recognition Audio Signal	(9) I	(9) —
(10) 10	(10) 0.35	(10) BK / GY	(10) 5152	(10) Voice Recognition Audio [-] Control	(10) I	(10) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(11) 11	(11) 0.35	(11) VT / YE	(11) 7043	(11) Microphone [+] Signal	(11) I	(11) —
(12) 12	(12) 0.35	(12) BU / BK	(12) 7044	(12) Microphone [-] Signal	(12) I	(12) —
13 - 29	—	—	—	Not Occupied	—	—

A11 Radio X5 (IOR)



5191842

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340320
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(OG)

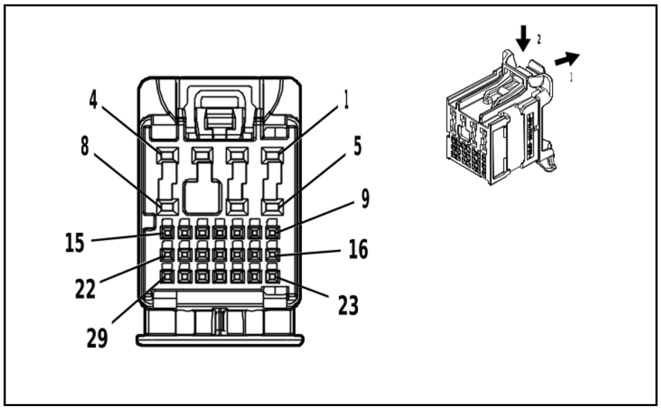
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X5 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Rear Vision Camera Coaxial Video Signal	I	—

A11 Radio X6 (IOK)



4578560

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160014-0011
- Service Connector: 13534971
- Description: 29-Way F 0.5 NANO, 1.2 MCON, stAK50h Series(DK-GY with GY Inner Connector)

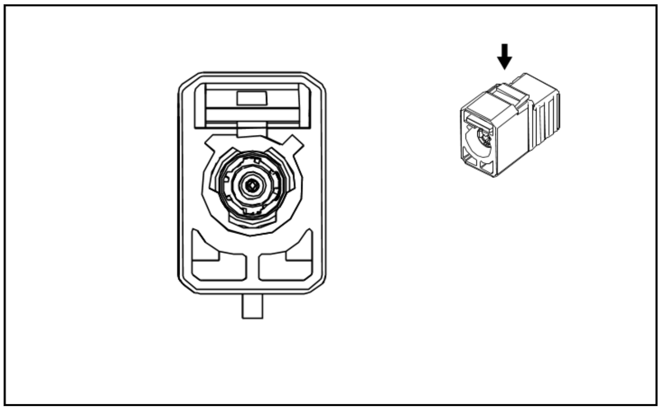
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

A11 Radio X6 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN	(1) 199	(1) Left Rear Speaker [+] Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) BU	(2) 201	(2) Left Front Speaker 1 [+] Control	(2) I	(2) —
(3) 3	(3) 0.75	(3) YE / BK	(3) 117	(3) Right Front Speaker [-] Control 1	(3) I	(3) —
(4) 4	(4) 0.75	(4) BU / BK	(4) 115	(4) Right Rear Speaker [-] Control	(4) I	(4) —
(5) 5	(5) 0.75	(5) BN / BU	(5) 118	(5) Left Front Speaker [-] Control 1	(5) I	(5) —
(6) 6	(6) 0.75	(6) YE	(6) 200	(6) Right Front Speaker 1 [+] Control	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.75	(8) WH	(8) 46	(8) Right Rear Speaker [+] Control	(8) I	(8) —
(9) 9	(9) 0.35	(9) BU / WH	(9) 4985	(9) AUTOSAR CAN Bus [+] 5 Serial Data	(9) I	(9) —
(10) 10	(10) 0.35	(10) BU / YE	(10) 4984	(10) AUTOSAR CAN Bus [-] 5 Serial Data	(10) I	(10) —
11 - 12	—	—	—	Not Occupied	—	—
(13) 13	(13) 0.35	(13) GN / WH	(13) 24	(13) Backup Lamp Control	(13) I	(13) —
14 - 29	—	—	—	Not Occupied	—	—

A11 Radio X6 (IOR)



Connector Part Information
- Harness Type: Radio Antenna Cable Extension Cable COAX
- OEM Connector: 3FA1-NASJ-C01W0
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

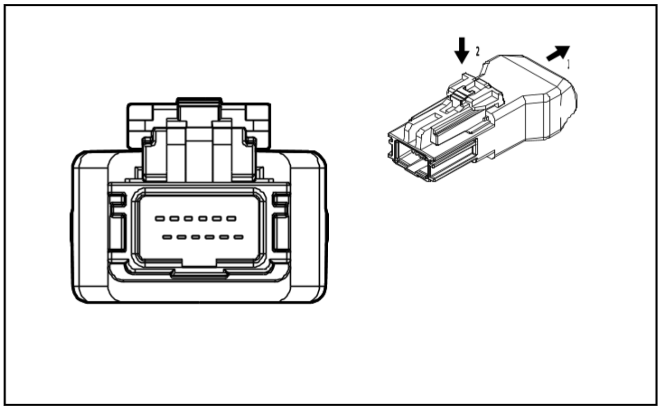
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X6 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(AM/FM) Antenna RF Signal	I	—

A11 Radio X7 (IOK)



Connector Part Information
- Harness Type: Instrument Panel Wiring Harness LVDS
- OEM Connector: 111146-7100
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 12-Way M 2.0 HSAL-2 Series(GY)

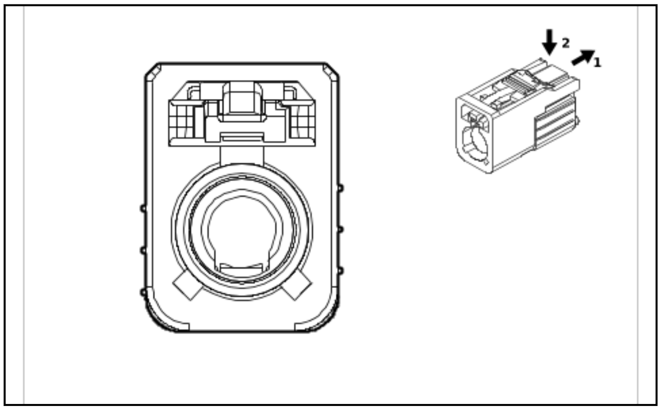
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X7 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	LVDS	—	(Infotainment) Infotainment Display Signal	I	—

A11 Radio X7 (IOR)



5794617

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340318
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(CU)

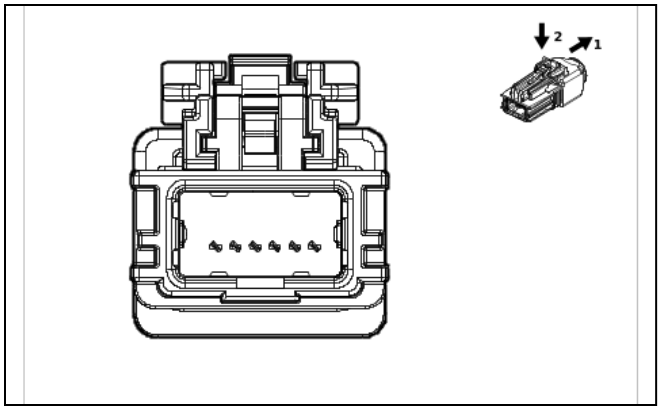
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X7 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(XM +/-HD) Coaxial Antenna XM Signal	I	—

A11 Radio X8 (IOK)



5987912

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness USB
- OEM Connector: 111146-7050
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 12-Way M 2.0 HSAL-2 Series(BK)

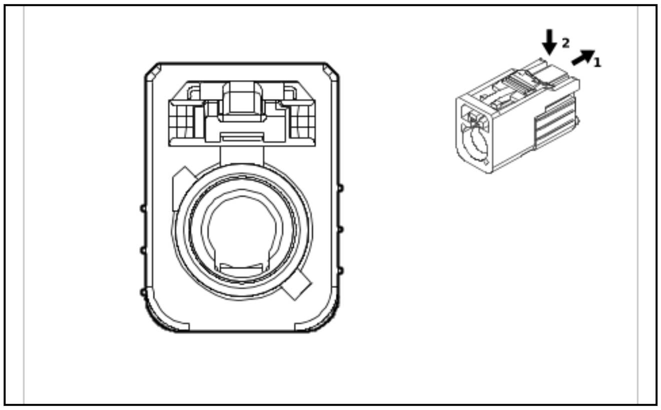
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X8 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	USB	—	USB Serial Data	I	—

A11 Radio X8 (IOR)



5518456

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340317
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BG)

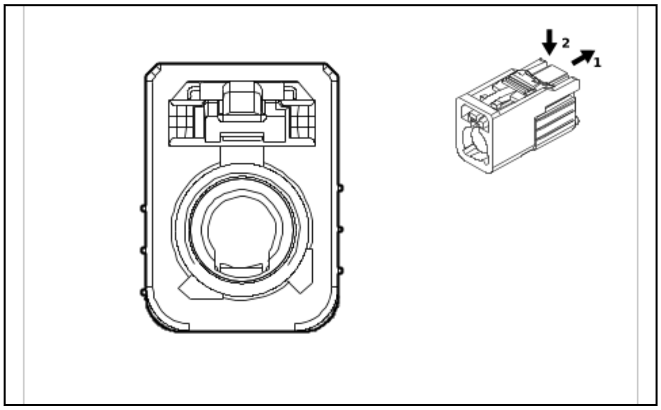
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X8 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	WiFi Antenna Coaxial Signal	I	—

A11 Radio X9 (IOK)



5191842

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340320
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(OG)

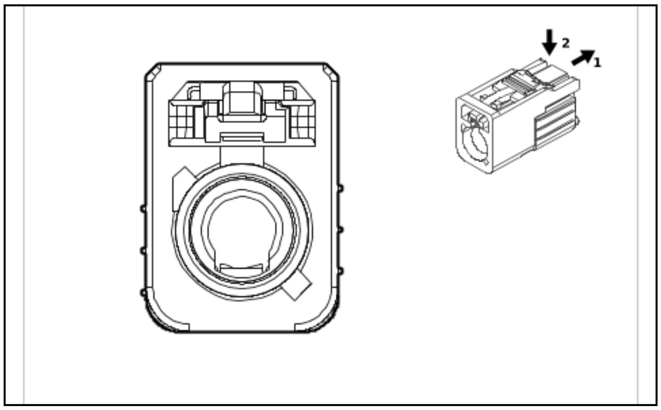
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X9 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Video Processing Module Coaxial Video Signal	I	—

A11 Radio X10 (IOK)



5518456

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340317
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BG)

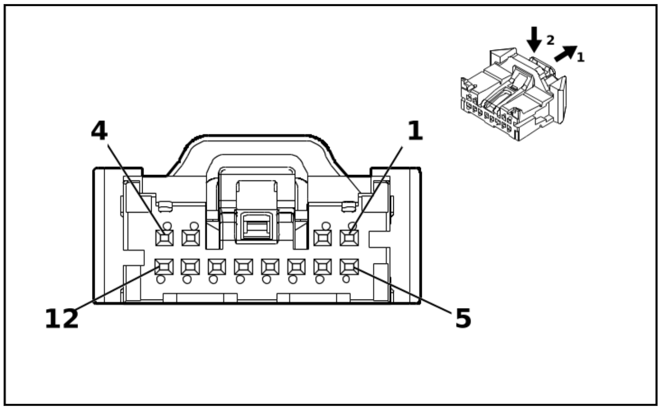
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A11 Radio X10 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	WiFi Antenna Coaxial Signal	I	—

A11 Radio X11 (IOK)



5360826

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35068239
- Service Connector: 13529935
- Description: 12-Way F 050 CTS Series(BK)

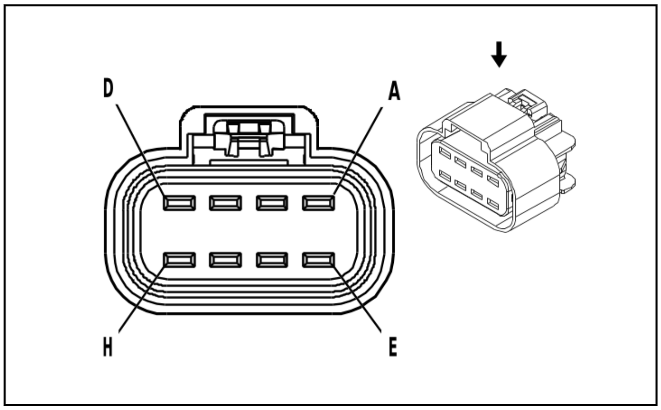
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Service by Cable	EL-35616-58 (BK)	EL-38125-58

A11 Radio X11 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) YE	(3) 4758	(3) Ethernet Bus 2 [+]	(3) I	(3) —
(4) 4	(4) 0.35	(4) BU	(4) 4757	(4) Ethernet Bus 2 [-]	(4) I	(4) —
5 - 7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.35	(8) YE	(8) 7215	(8) Ethernet Bus 6 [+]	(8) I	(8) —
(9) 9	(9) 0.35	(9) GN	(9) 7214	(9) Ethernet Bus 6 [-]	(9) I	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) BN	(11) 7211	(11) Ethernet Bus 4 [+]	(11) I	(11) —
(12) 12	(12) 0.35	(12) GY	(12) 7210	(12) Ethernet Bus 4 [-]	(12) I	(12) —

A16 Transfer Case Four Wheel Drive Actuator



646372

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13538370
- Service Connector: 19369184
- Description: 8-Way F 280 GT Series, Sealed(BK)

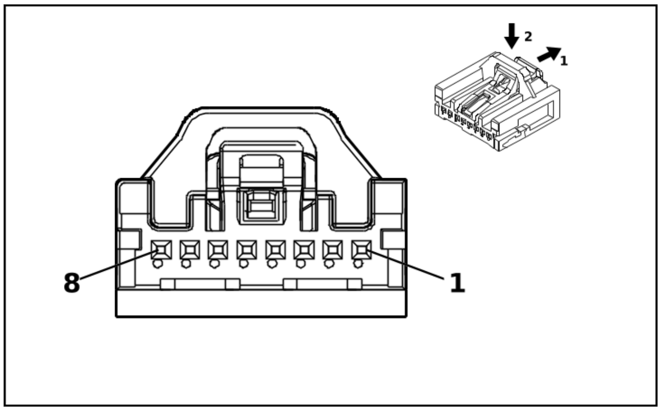
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

A16 Transfer Case Four Wheel Drive Actuator

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	2.5	YE / GY	1552	Transfer Case Motor Clockwise Control	I	—
B	0.75	BU	8013	Transfer Case Lock Solenoid Control 2	I	—
C	0.75	YE / BN	1569	Transfer Case Lock Solenoid Valve Control	I	—
D	2.5	YE / VT	1553	Transfer Case Motor Counter Clockwise Control	I	—
E	0.5	YE	7474	Incremental Encoder Direction Signal	I	—
F	0.5	BU / GY	7473	Incremental Encoder Impulse Signal	I	—
G	0.5	WH / GN	7475	Incremental Encoder Sensor Voltage Reference	I	—
H	0.5	VT	7476	Incremental Encoder Sensor Low Reference	I	—

A22 Radio Control X1 (IOK)



5200269

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35068228
- Service Connector: 84769201
- Description: 8-Way F Mini 50 Series(BK)

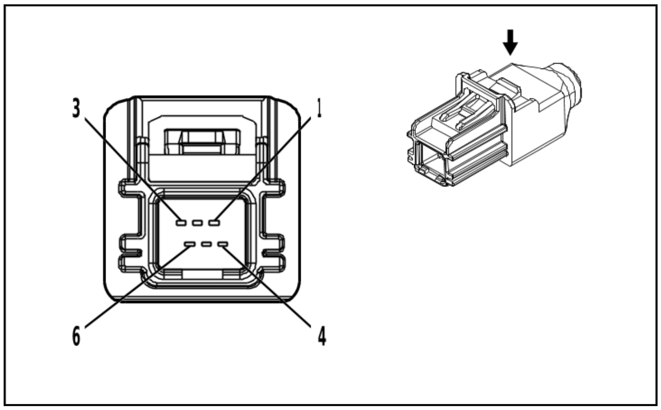
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required

A22 Radio Control X1 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) RD / WH	(1) 1340	(1) Battery Positive Voltage	(1) I	(1) —
2 - 7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.35	(8) BK / WH	(8) 1051	(8) Signal Ground	(8) I	(8) —

A22 Radio Control X2 (IOK)



4806625

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 100337-1020
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 6-Way M HSAL-2 Series(BK)

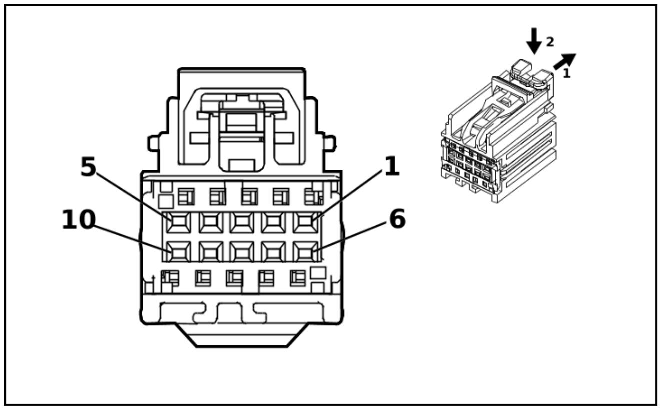
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

A22 Radio Control X2 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 6	—	—	—	Not Occupied	—	—
BK	0	<p01>	LVDS	Low Voltage Differential Signaling	I	—

A23D Front Side Door Latch - Driver



4622549

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: 7289-5068-60
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 0.64 Kaizen Series(GN)

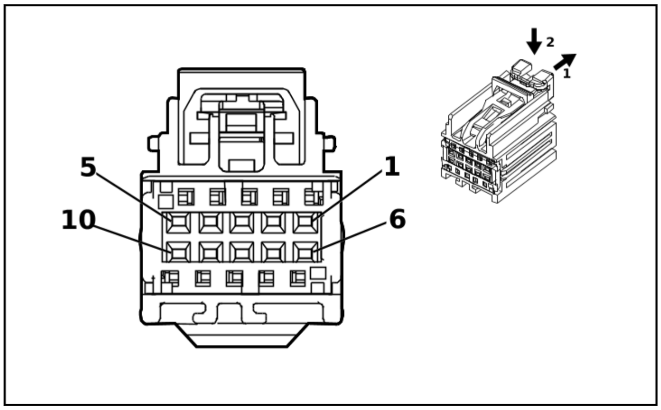
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

A23D Front Side Door Latch - Driver

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY	(1) 745	(1) Left Front Door Ajar Switch Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / GY	(2) 126	(2) Left Front Door Open Switch Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK	(3) 1550	(3) Ground	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH / VT	(4) 4258	(4) Left Front Door Lock Status Signal	(4) I	(4) —
5 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.75	(7) GY	(7) 2681	(7) Left Front Door Lock Actuator Lock Control	(7) I	(7) —
(8) 8	(8) 0.75	(8) WH	(8) 2679	(8) Lock Actuators Unlock Control 1	(8) I	(8) —
9 - 10	—	—	—	Not Occupied	—	—

A23LR Rear Side Door Latch - Left



4622549

Connector Part Information

- Harness Type: Rear Side Door Door Wiring Harness - Left
- OEM Connector: 7289-5068-60
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 0.64 Kaizen Series(GN)

Terminal Part Information

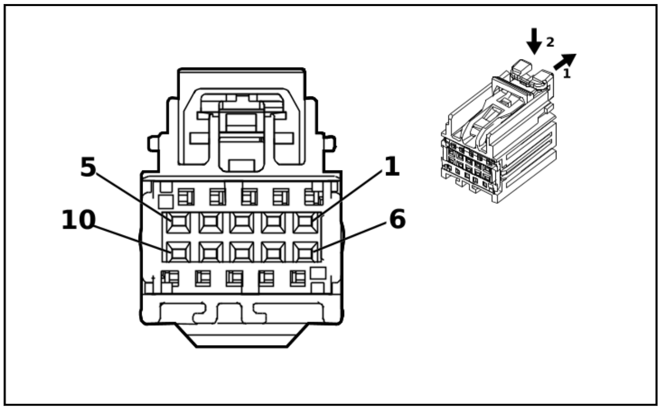
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

A23LR Rear Side Door Latch - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY	(1) 747	(1) Left Rear Door Ajar Switch Signal	(1) I	(1) —
2	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(3) 3	(3) 0.5	(3) BK	(3) 1550	(3) Ground	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.75	(7) BU / YE	(7) 1091	(7) Left Rear Door Lock Actuator Lock Control	(7) I	(7) —
(8) 8	(8) 0.75	(8) WH	(8) 2679	(8) Lock Actuators Unlock Control 1	(8) I	(8) —
9 - 10	—	—	—	Not Occupied	—	—

A23P Front Side Door Latch - Passenger



4622549

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 7289-5068-60
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 0.64 Kaizen Series(GN)

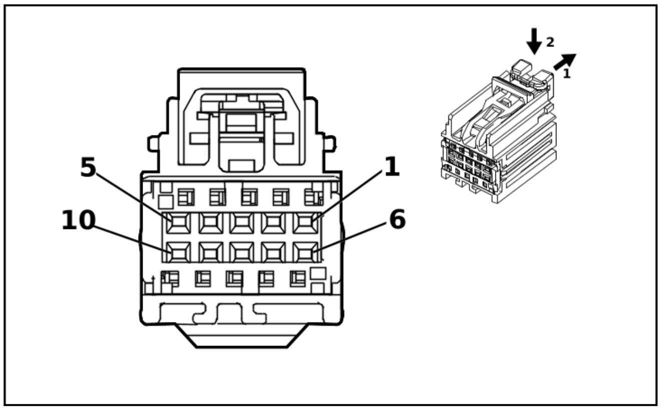
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

A23P Front Side Door Latch - Passenger

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) BK	(3) 1350	(3) Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) GY	(5) 746	(5) Right Front Door Ajar Switch Signal	(5) I	(5) —
6 - 7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.75	(8) GY / BK	(8) 2680	(8) Lock Actuators Unlock Control 2	(8) I	(8) —
(9) 9	(9) 0.75	(9) YE / GN	(9) 2682	(9) Right Front Door Lock Actuator Lock Control	(9) I	(9) —
10	—	—	—	Not Occupied	—	—

A23RR Rear Side Door Latch - Right



4622549

Connector Part Information

- Harness Type: Rear Side Door Door Wiring Harness - Right
- OEM Connector: 7289-5068-60
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 0.64 Kaizen Series(GN)

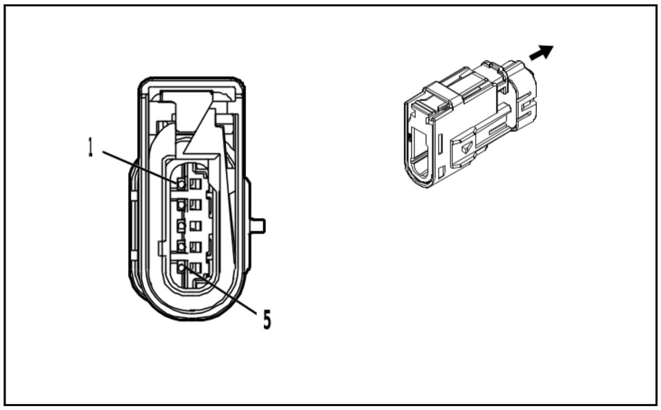
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

A23RR Rear Side Door Latch - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) BK	(3) 1350	(3) Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) GY	(5) 748	(5) Right Rear Door Ajar Switch Signal	(5) I	(5) —
6 - 7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.75	(8) GY / BK	(8) 2680	(8) Lock Actuators Unlock Control 2	(8) I	(8) —
(9) 9	(9) 0.75	(9) VT / WH	(9) 1094	(9) Right Rear Door Lock Actuator Lock Control	(9) I	(9) —
10	—	—	—	Not Occupied	—	—

A24D Front Side Door Outside Handle - Left



4808321

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: SRVWSB-04A-BS
- Service Connector: Service by Harness - See Part Catalog
- Description: 5-Way M 1.2 Series, Sealed(NA)

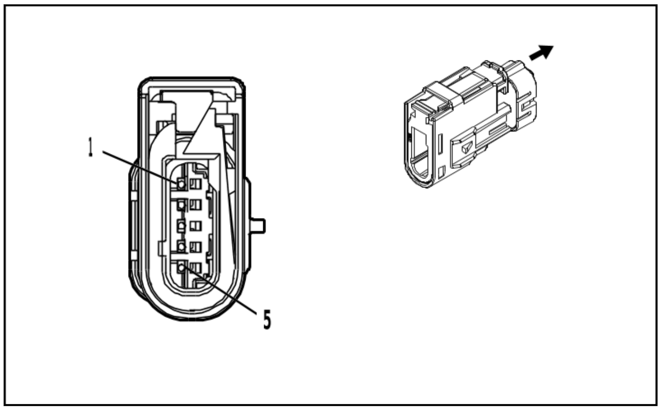
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

A24D Front Side Door Outside Handle - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU	(1) 2675	(1) Left Front Exterior Door Handle Switch Unlock Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT	(2) 4301	(2) Passive Entry Left Antenna Signal High	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.5	(4) VT / GY	(4) 4302	(4) Passive Entry Left Antenna Signal Low	(4) I	(4) —
(5) 5	(5) 0.5	(5) BK / WH	(5) 1551	(5) Signal Ground	(5) I	(5) —

A24P Front Side Door Outside Handle - Right



4808321

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: SRVWSB-04A-BS
- Service Connector: Service by Harness - See Part Catalog
- Description: 5-Way M 1.2 Series, Sealed(NA)

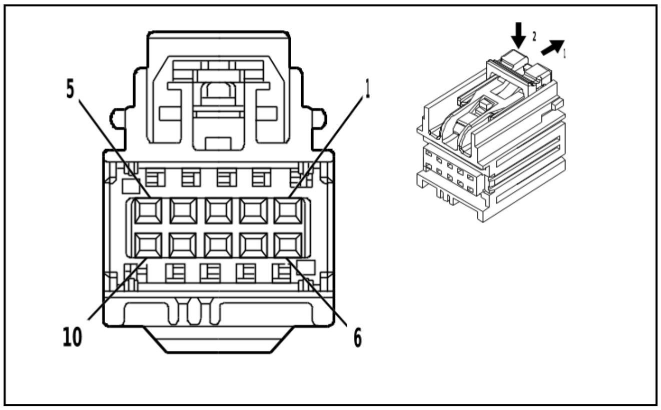
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

A24P Front Side Door Outside Handle - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / VT	(1) 2676	(1) Right Front Door Exterior Switch Unlock Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / YE	(2) 4303	(2) Passive Entry Right Antenna Signal High	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.5	(4) GN / BK	(4) 4304	(4) Passive Entry Right Antenna Signal Low	(4) I	(4) —
(5) 5	(5) 0.5	(5) BK / WH	(5) 1451	(5) Signal Ground	(5) I	(5) —

A26 Heater and Air Conditioning User Interface Control - Front



4891168

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 7289-4885
- Service Connector: 13509649
- Description: 10-Way F 0.64 Kaizen Series(NA)

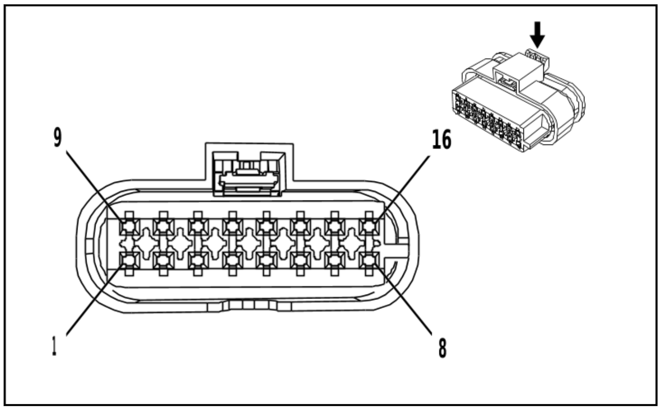
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19300629	J-35616-64B (L-BU)	J-38125-215A

A26 Heater and Air Conditioning User Interface Control - Front

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / WH	(1) 1340	(1) Battery Positive Voltage	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) BU / WH	(3) 4985	(3) AUTOSAR CAN Bus [+] 5 Serial Data	(3) I	(3) —
(4) 4	(4) 0.35	(4) BU / WH	(4) 4985	(4) AUTOSAR CAN Bus [+] 5 Serial Data	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.35	(6) GY / GN	(6) 4636	(6) HVAC System Enable Signal	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.35	(8) BU / YE	(8) 4984	(8) AUTOSAR CAN Bus [-] 5 Serial Data	(8) I	(8) —
(9) 9	(9) 0.35	(9) BU / YE	(9) 4984	(9) AUTOSAR CAN Bus [-] 5 Serial Data	(9) I	(9) —
(10) 10	(10) 0.5	(10) BK / WH	(10) 851	(10) Signal Ground	(10) I	(10) —

A38 Reductant Tank Fluid Supply Pump Module



4259227

Connector Part Information

- Harness Type: Emission Reduction Fluid Tank Reservoir Wire Harness
- OEM Connector: 805-587-551
- Service Connector: Service by Harness - See Part Catalog
- Description: 16-Way F 1.2 MLK Series, Sealed(BK)

Terminal Part Information

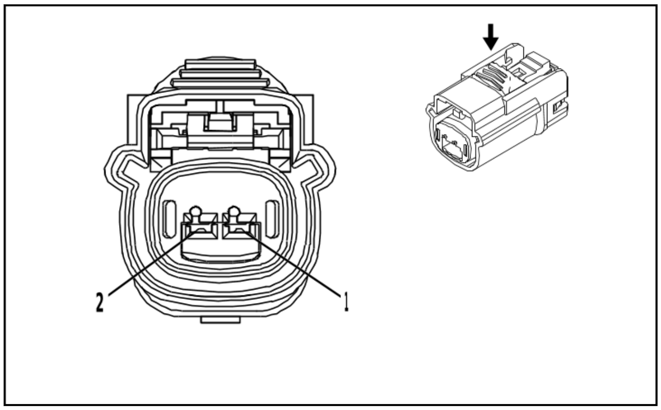
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

A38 Reductant Tank Fluid Supply Pump Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 3244	(1) Diesel Exhaust Fluid Tank Temperature Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN	(2) 3245	(2) Diesel Exhaust Fluid Tank Temperature Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU	(3) 3107	(3) Diesel Exhaust Fluid Pressure Sensor Low Reference	(3) I	(3) —
(4) 4	(4) 0.5	(4) BU	(4) 3108	(4) Diesel Exhaust Fluid Pressure Sensor Signal	(4) I	(4) —
(5) 5	(5) 0.5	(5) BN	(5) 3106	(5) Diesel Exhaust Fluid Pressure Sensor 5 Volt Reference	(5) I	(5) —
(6) 6	(6) 1	(6) BU	(6) 4318	(6) Diesel Exhaust Fluid Tank Heater Low Control	(6) I	(6) —
(7) 7	(7) 1	(7) WH	(7) 3103	(7) Diesel Exhaust Fluid Smart Pump Control	(7) I	(7) —
(8) 8	(8) 1	(8) BN	(8) 3875	(8) Diesel Exhaust Fluid Smart Pump Supply Voltage Phase 2	(8) I	(8) —
(9) 9	(9) 1	(9) YE	(9) 3677	(9) Diesel Exhaust Fluid Reservoir Heater Control	(9) I	(9) —
10 - 11	—	—	—	Not Occupied	—	—
(12) 12	(12) 1	(12) BN	(12) 3676	(12) Diesel Exhaust Fluid Heating Tank 2 Heater Control	(12) I	(12) —
13	—	—	—	Not Occupied	—	—
(14) 14	(14) 1	(14) BK	(14) 2937	(14) Diesel Exhaust Fluid Pump Motor Stator Low Reference	(14) I	(14) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(15) 15	(15) 1	(15) YE	(15) 3876	(15) Diesel Exhaust Fluid Smart Pump Supply Voltage Phase 3	(15) I	(15) —
(16) 16	(16) 1	(16) BN	(16) 2936	(16) Diesel Exhaust Fluid Heating Tank 2 Heater Control Low	(16) I	(16) —

A99L Pickup Box Endgate Latch - Left



4332222

Connector Part Information

- Harness Type: Endgate Wiring Harness
- OEM Connector: 15514573
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 OCS Series, Sealed(BK)

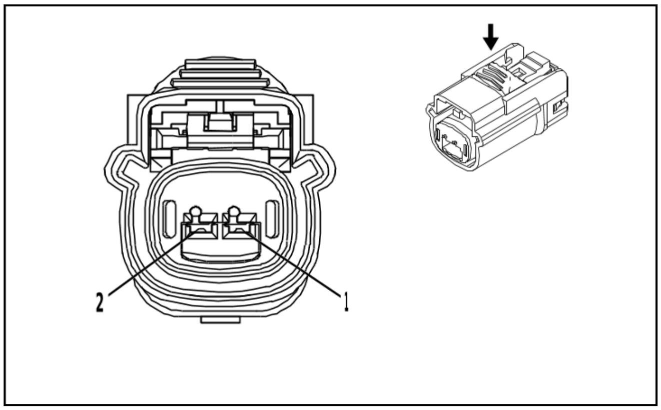
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

A99L Pickup Box Endgate Latch - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) GN	(1) 1299	(1) Major Endgate Motor Control	(1) I	(1) —
(2) 2	(2) 1	(2) YE / BK	(2) 7730	(2) Major Endgate Motor Low Reference	(2) I	(2) —

A99R Pickup Box Endgate Latch - Right



4332222

Connector Part Information
- Harness Type: Endgate Wiring Harness
- OEM Connector: 15514573
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 OCS Series, Sealed(BK)

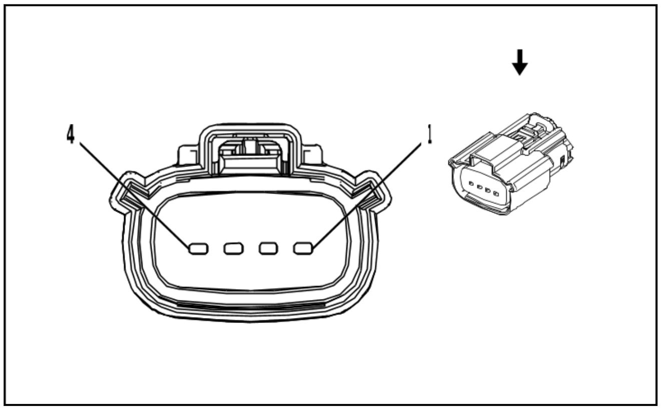
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

A99R Pickup Box Endgate Latch - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) GN	(1) 1299	(1) Major Endgate Motor Control	(1) I	(1) —
(2) 2	(2) 1	(2) YE / BK	(2) 7730	(2) Major Endgate Motor Low Reference	(2) I	(2) —

A100L Pickup Box Auxiliary Endgate Latch - Left



2474747

Connector Part Information
- Harness Type: Endgate Wiring Harness
- OEM Connector: 33471-0406
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 1.5 Series, Sealed(BK)

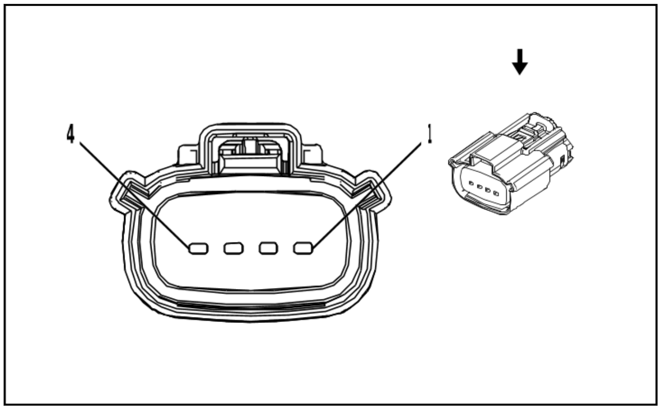
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

A100L Pickup Box Auxiliary Endgate Latch - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) YE / BU	(1) 7295	(1) Left Minor Endgate Ajar Signal	(1) I	(1) —
(2) 2	(2) 0.75	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —
(3) 3	(3) 1	(3) YE / BK	(3) 7730	(3) Major Endgate Motor Low Reference	(3) I	(3) —
(4) 4	(4) 1	(4) VT	(4) 7725	(4) Minor Endgate Motor Control	(4) I	(4) —

A100R Pickup Box Auxiliary Endgate Latch - Right



2474747

Connector Part Information

- Harness Type: Endgate Wiring Harness
- OEM Connector: 33471-0406
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 1.5 Series, Sealed(BK)

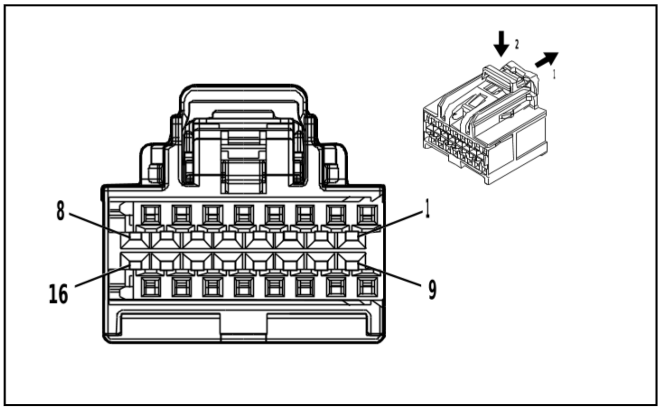
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

A100R Pickup Box Auxiliary Endgate Latch - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) YE / BK	(1) 7730	(1) Major Endgate Motor Low Reference	(1) I	(1) —
(2) 2	(2) 1	(2) VT	(2) 7725	(2) Minor Endgate Motor Control	(2) I	(2) —
3 - 4	—	—	—	Not Occupied	—	—

A103 Roof Console X1



4873254

Connector Part Information

- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 35016344
- Service Connector: 13519739
- Description: 16-Way F 0.64 OCS Series(GY)

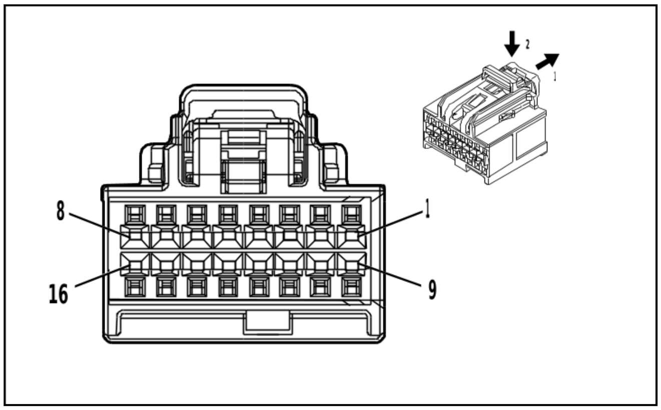
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84619127	J-35616-64B (L-BU)	J-38125-215A

A103 Roof Console X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) YE	(3) 6817	(3) LED Backlight Dimming Control 1	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.35	(7) WH / BN	(7) 2904	(7) Row 2 Dome Reading Lamp Switch Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) VT / GY	(8) 2906	(8) Row 2 Dome Reading Lamp 2 Switch Signal	(8) I	(8) —
(9) 9	(9) 0.5	(9) RD / YE	(9) 240	(9) Battery Positive Voltage	(9) I	(9) —
(10) 10	(10) 0.5	(10) GN / WH	(10) 2854	(10) Body Control Module LIN Bus 8	(10) I	(10) —
(11) 11	(11) 0.35	(11) BU / GN	(11) 4785	(11) Interior Lamp Overhead Enable Signal	(11) I	(11) —
(12) 12	(12) 0.35	(12) GY / WH	(12) 2369	(12) Interior Lamp Overhead 2 Enable Signal	(12) I	(12) —
(13) 13	(13) 0.35	(13) GN / YE	(13) 2903	(13) Row 2 Dome Reading Lamp Interior Lamp Control	(13) I	(13) —
(14) 14	(14) 0.35	(14) BN / BU	(14) 2905	(14) Row 2 Dome Reading Lamp 2 Interior Lamp Control	(14) I	(14) —
15	—	—	—	Not Occupied	—	—
(16) 16	(16) 0.5	(16) BK	(16) 1050	(16) Ground	(16) I	(16) —

A103 Roof Console X2



4873243

Connector Part Information

- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 35016343
- Service Connector: 13519738
- Description: 16-Way F 0.64 OCS Series(BK)

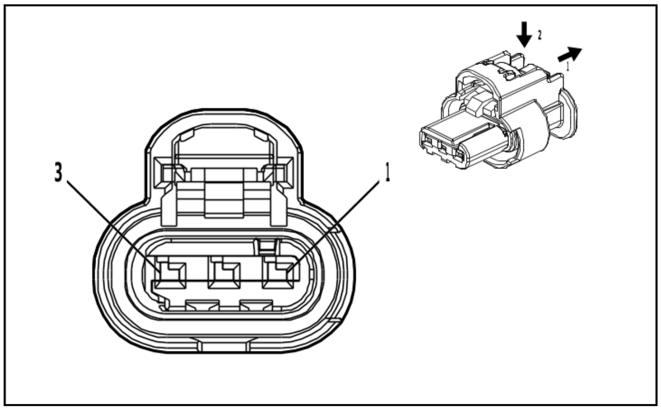
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84619127	J-35616-64B (L-BU)	J-38125-215A

A103 Roof Console X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) YE / VT	(1) 2516	(1) Telematics Switch Green LED Indicator Control	(1) I	(1) —
(2) 2	(2) 0.35	(2) BN / WH	(2) 2517	(2) Telematics Switch Red LED Indicator Control	(2) I	(2) —
(3) 3	(3) 0.35	(3) GN / WH	(3) 2514	(3) Telematics Switch Signal	(3) I	(3) —
(4) 4	(4) 0.35	(4) GN / BK	(4) 2515	(4) Telematics Switch Supply Voltage	(4) I	(4) —
(5) 5	(5) 0.35	(5) BK / WH	(5) 851	(5) Signal Ground	(5) I	(5) —
(6) 6	(6) 0.35	(6) YE / VT	(6) 6191	(6) Power Rear Window Switch Open Signal	(6) I	(6) —
(7) 7	(7) 0.35	(7) WH	(7) 6192	(7) Sliding Rear Window Switch Close Signal	(7) I	(7) —
(8) 8	(8) 0.5	(8) VT	(8) 801	(8) Retained Accessory Power Control	(8) I	(8) —
9 - 16	—	—	—	Not Occupied	—	—

B1 Air Conditioning Refrigerant Pressure Sensor



4581126

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: 86792094
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

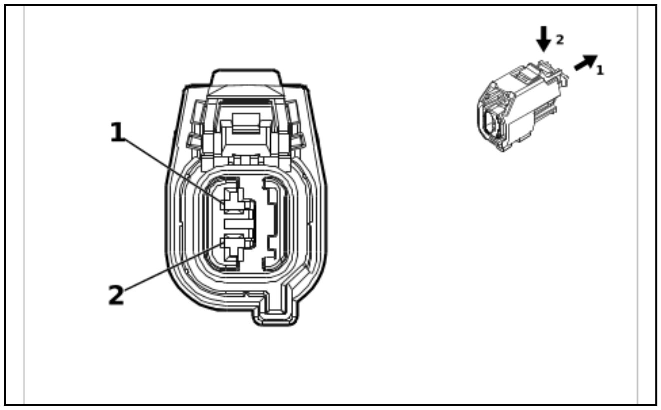
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B1 Air Conditioning Refrigerant Pressure Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / RD	(1) 480	(1) Engine Control Vehicle Sensors 5 Volt Reference 1	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN	(2) 380	(2) Air Conditioning Refrigerant Pressure Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / GY	(3) 626	(3) Engine Control Vehicle Sensors Low Reference 1	(3) I	(3) —

B5LF Front Wheel Speed Sensor - Left



5666214

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 33189092
- Service Connector: 85526683
- Description: 2-Way F 1.5 OCS Series, Sealed(GY)

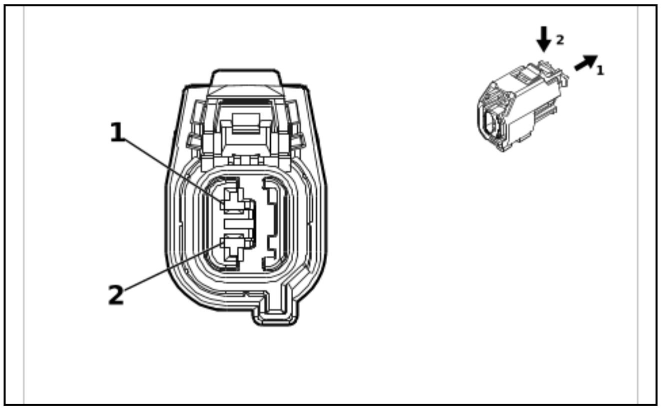
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

B5LF Front Wheel Speed Sensor - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / WH	(1) 7064	(1) Left Front Wheel Speed Sensor Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 830	(2) Left Front Wheel Speed Sensor Signal	(2) I	(2) —

B5LR Rear Wheel Speed Sensor - Left



5666214

Connector Part Information
- Harness Type: Chassis Entension Wiring Harness
- OEM Connector: 33189092
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 OCS Series, Sealed(GY)

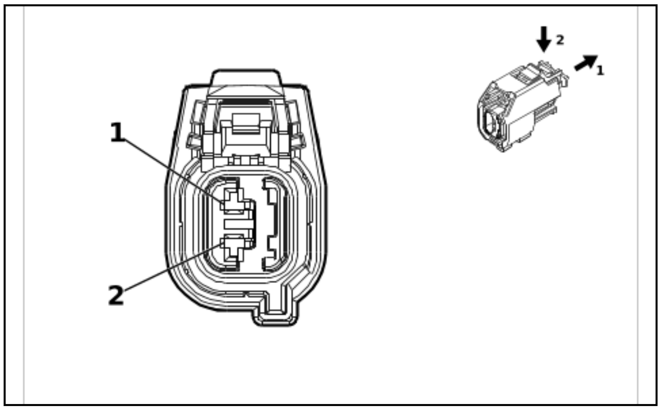
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B5LR Rear Wheel Speed Sensor - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) TN	(1) 7127	(1) Left Rear Wheel Speed Sensor Control	(1) I	(1) —
(2) 2	(2) —	(2) OG	(2) 884	(2) Left Rear Wheel Speed Sensor Signal	(2) I	(2) —

B5RF Front Wheel Speed Sensor - Right



5666214

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 33189092
- Service Connector: 85526683
- Description: 2-Way F 1.5 OCS Series, Sealed(GY)

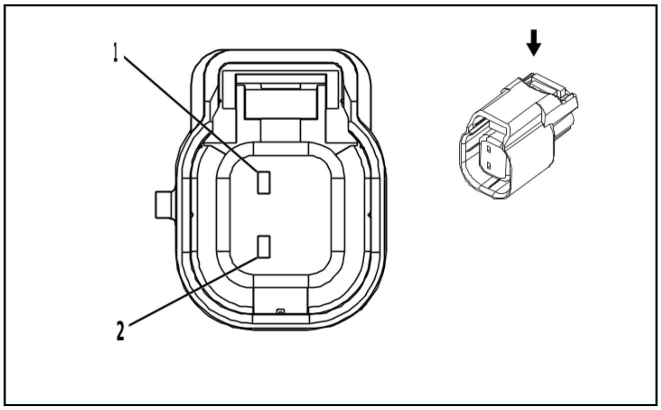
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-2A (GY)	No Tool Required

B5RF Front Wheel Speed Sensor - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5 (1) 0.5	(1) GY / BN (1) GY / BN	(1) 7065 (1) 7065	(1) Right Front Wheel Speed Sensor Control (1) Right Front Wheel Speed Sensor Control	(1) I (1) II	(1) — (1) —
(2) 2	(2) 0.5 (2) 0.5	(2) YE (2) YE	(2) 872 (2) 872	(2) Right Front Wheel Speed Sensor Signal (2) Right Front Wheel Speed Sensor Signal	(2) I (2) II	(2) — (2) —

B5RR Rear Wheel Speed Sensor - Right



4115616

Connector Part Information
- Harness Type: Chassis Extension Wiring Harness
- OEM Connector: 34062-0046
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

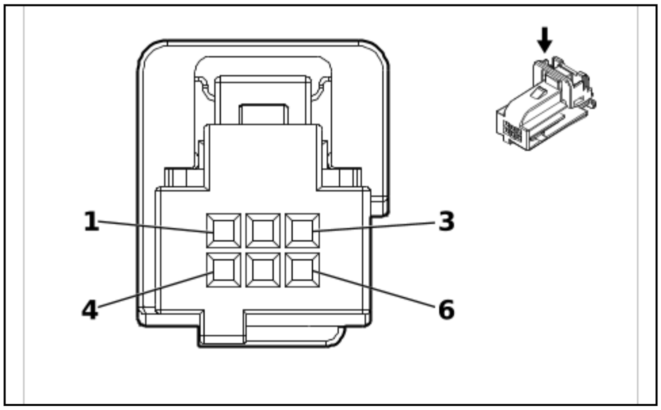
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B5RR Rear Wheel Speed Sensor - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) TN	(1) 7128	(1) Right Rear Wheel Speed Sensor Control	(1) I	(1) —
(2) 2	(2) —	(2) OG	(2) 882	(2) Right Rear Wheel Speed Sensor Signal	(2) I	(2) —

B10D Sun Load and Ambient Light and Security Indicator Sensor



2282896

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 13518220
- Service Connector: 85587649
- Description: 6-Way F 0.64 Micro-Quadlock Series(BK)

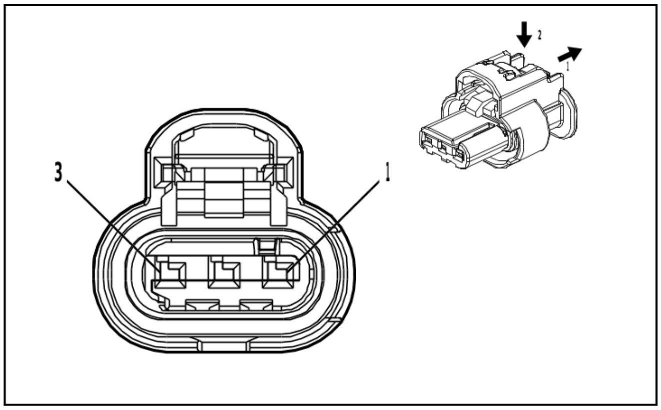
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B10D Sun Load and Ambient Light and Security Indicator Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GY	(1) 590	(1) Driver Solar Sensor Signal	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) WH / BU	(3) 278	(3) Ambient Light Sensor Signal	(3) I	(3) —
(4) 4	(4) 0.35	(4) BU / WH	(4) 734	(4) Inside Air Temperature Sensor Signal	(4) I	(4) —
(5) 5	(5) 0.35	(5) GY	(5) 728	(5) Security Indicator Control	(5) I	(5) —
(6) 6	(6) 0.35	(6) BK / YE	(6) 407	(6) Sensor Low Reference	(6) I	(6) —

B12P Automatic Transmission Fluid Pressure Sensor - Power Take-Off (NQF / NQH)



4581126

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: 86792094
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

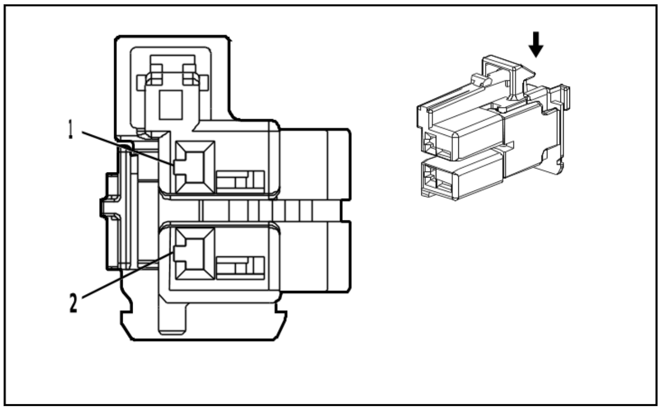
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B12P Automatic Transmission Fluid Pressure Sensor - Power Take-Off (NQF / NQH)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 8232	(1) Power Take Off Pressure Sensor 5 Volt Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / WH	(2) 8234	(2) Power Take Off Pressure Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE	(3) 8233	(3) Power Take Off Pressure Sensor Low Reference	(3) I	(3) —

B13 Automatic Transmission Fluid Temperature Sensor



4672650

Connector Part Information

- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BN)

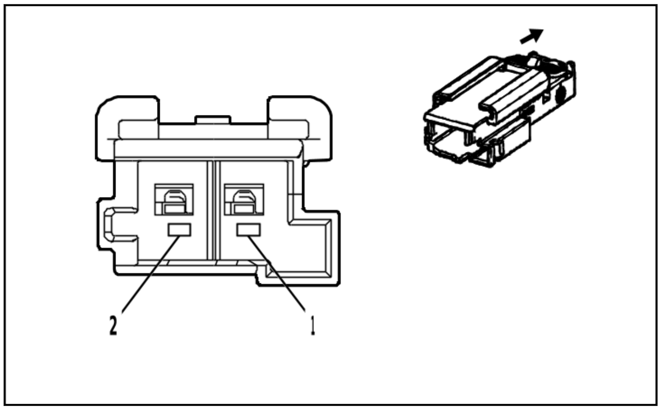
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B13 Automatic Transmission Fluid Temperature Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU / BN	(1) 586	(1) Transmission Fluid Temperature Sensor Low Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / YE	(2) 585	(2) Transmission Fluid Temperature Sensor Signal	(2) I	(2) —

B14A Automatic Transmission Output Speed Sensor



4672593

Connector Part Information

- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2340311-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 MCON Series(BU)

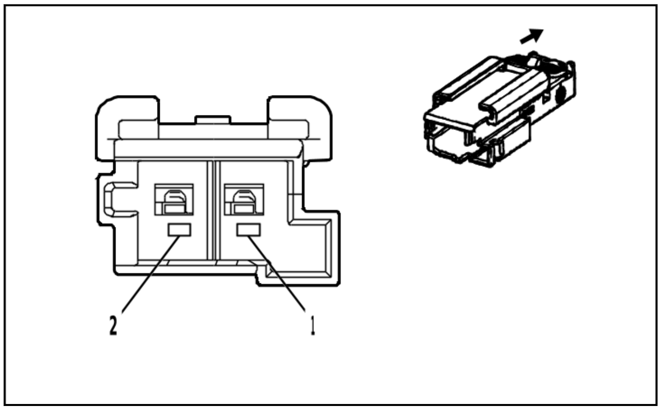
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

B14A Automatic Transmission Output Speed Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE / OG	(1) 6358	(1) Output Speed Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN	(2) 4170	(2) Transmission Output Shaft Speed Sensor Circuit 9V Reference	(2) I	(2) —

B14C Automatic Transmission Input Speed Sensor



4672611

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2340311-3
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 MCON Series(GN)

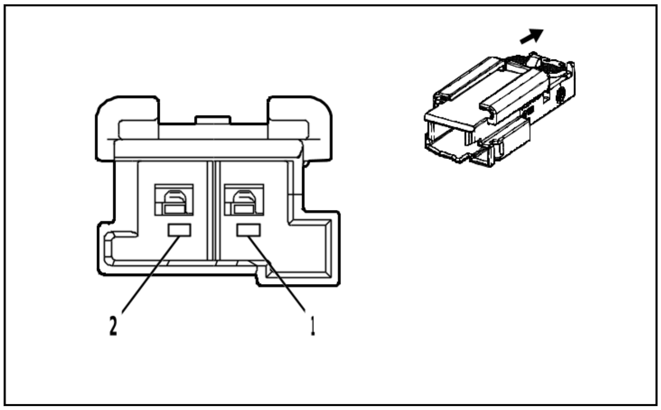
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

B14C Automatic Transmission Input Speed Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / VT	(1) 6353	(1) Input Speed Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU	(2) 4171	(2) Transmission Input Shaft Speed Sensor Circuit 9V Reference	(2) I	(2) —

B14DA Automatic Transmission Intermediate Speed Sensor 1



4663490

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2340311-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 MCON Series(NA)

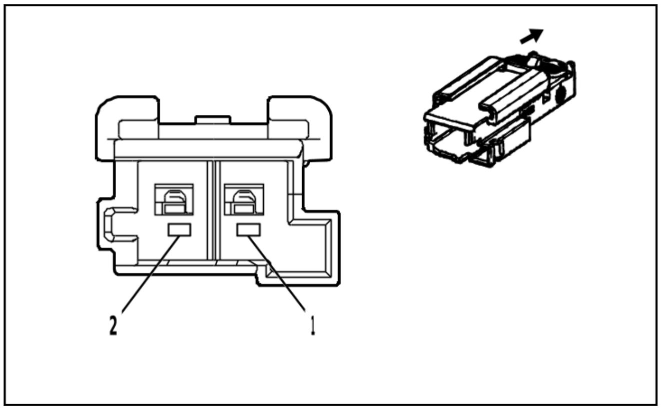
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

B14DA Automatic Transmission Intermediate Speed Sensor 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / GN	(1) 4510	(1) Transmission Intermediate Speed Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN	(2) 4170	(2) Transmission Output Shaft Speed Sensor Circuit 9V Reference	(2) I	(2) —

B14DB Automatic Transmission Intermediate Speed Sensor 2



4672593

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2340311-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 MCON Series(BU)

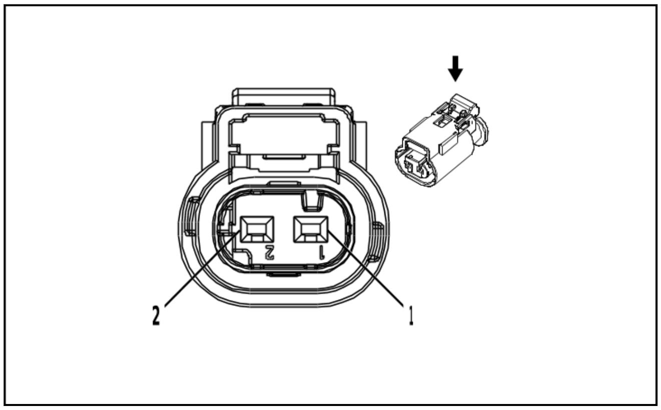
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

B14DB Automatic Transmission Intermediate Speed Sensor 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / BU	(1) 6254	(1) Transmission Input Speed Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU	(2) 4171	(2) Transmission Input Shaft Speed Sensor Circuit 9V Reference	(2) I	(2) —

B20A Brake Fluid Level Indicator Switch



2717066

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 10010337
- Service Connector: 13587326
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

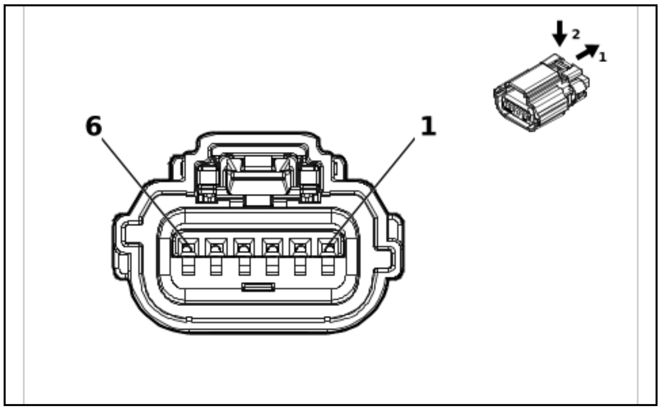
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required

B20A Brake Fluid Level Indicator Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / GY	(1) 333	(1) Brake Fluid Level Signal	(1) II	(1) —
(2) 2	(2) 1	(2) BK	(2) 150	(2) Ground	(2) I	(2) —

B22 Brake Pedal Position Sensor



5921818

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35547326
- Service Connector: 86825468
- Description: 6-Way F 0.64 OCS Series, Sealed(NA)

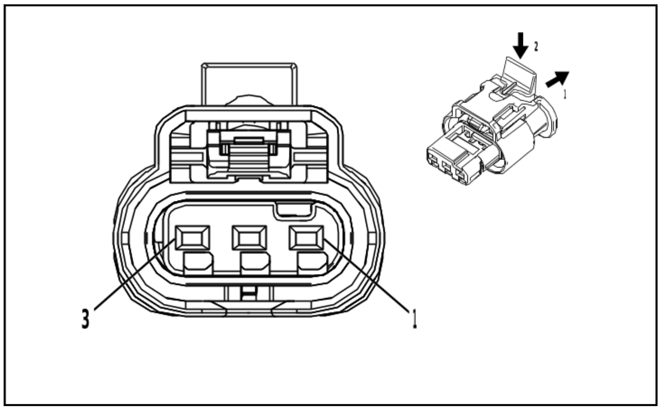
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B22 Brake Pedal Position Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK / BN	(1) 5360	(1) Brake Apply Sensor Low Reference	(1) I	(1) —
(2) 2	(2) 0.35	(2) WH	(2) 5359	(2) Brake Apply Sensor Control	(2) I	(2) —
(3) 3	(3) 0.35	(3) BU / YE	(3) 5361	(3) Brake Apply Sensor Signal	(3) I	(3) —
(4) 4	(4) 0.35	(4) WH / GN	(4) 5380	(4) Brake Position Sensor Signal	(4) I	(4) —
(5) 5	(5) 0.35	(5) BK / GY	(5) 626	(5) Engine Control Vehicle Sensors Low Reference 1	(5) I	(5) —
(6) 6	(6) 0.35	(6) WH / RD	(6) 480	(6) Engine Control Vehicle Sensors 5 Volt Reference 1	(6) I	(6) —

B23 Camshaft Position Sensor (L5P)



4249125

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13594670
- Service Connector: 86792094
- Description: 3-Way F 1.2 MCP Series, Sealed(BN)

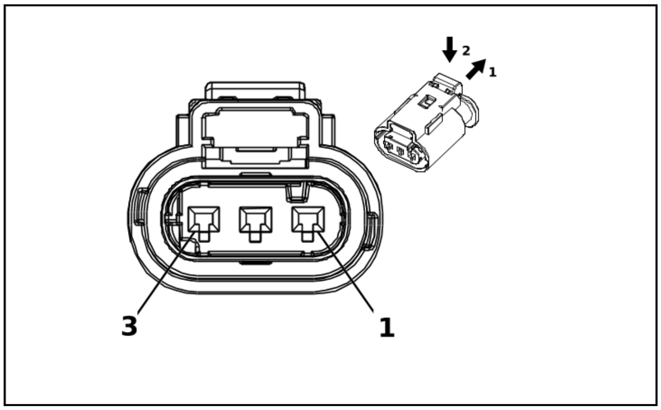
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B23 Camshaft Position Sensor (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / YE	(1) 5297	(1) Exhaust Camshaft Position Sensor 1 Voltage Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 5296	(2) Exhaust Camshaft Position Sensor Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) VT / BK	(3) 5273	(3) Exhaust Camshaft Position Sensor 1	(3) I	(3) —

B23 Camshaft Position Sensor (L8T)



2717069

Connector Part Information
- Harness Type: Camshaft Position Sensor Wire
- OEM Connector: 13503570
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 Multilock Series, Sealed(BK)

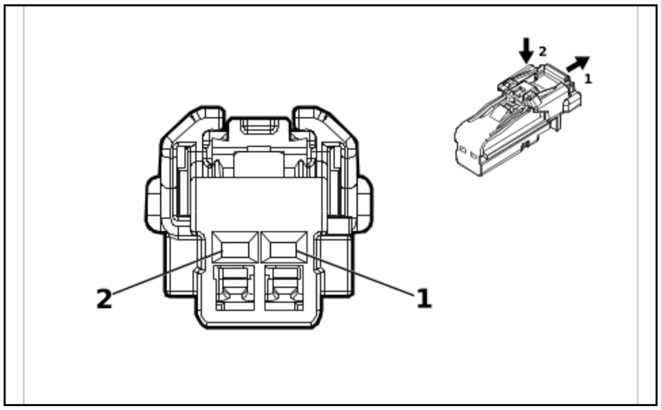
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B23 Camshaft Position Sensor (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / BU	(1) 5300	(1) Intake Camshaft Position Sensor 1 Voltage Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GN	(2) 5301	(2) Intake Camshaft Position Sensor Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / VT	(3) 5275	(3) Intake Camshaft Position Sensor 1	(3) I	(3) —

B24LF Mobile Telephone Microphone - Left Front



4115691

Connector Part Information
- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: 87816612
- Description: 2-Way F 1.2 MCON Series(BK)

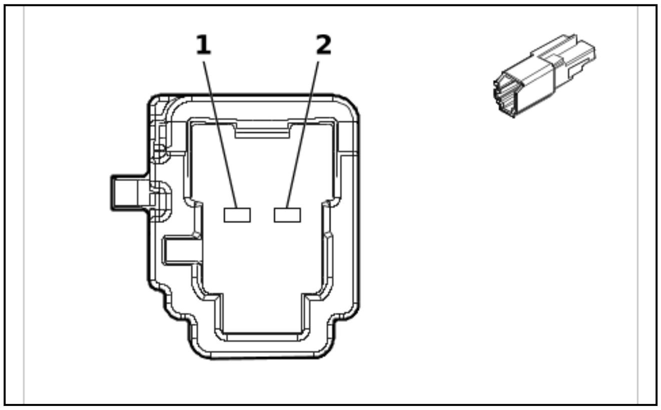
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B24LF Mobile Telephone Microphone - Left Front

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK / BN	(1) 654	(1) Cellular Telephone Microphone Low Reference	(1) I	(1) —
(2) 2	(2) 0.35	(2) BU	(2) 655	(2) Cellular Telephone Microphone Signal	(2) I	(2) —

B24RF Mobile Telephone Microphone - Right Front



6529127

Connector Part Information
- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 6099-0611
- Service Connector: 85725004
- Description: 2-Way M 1.2 MBS Series(GY)

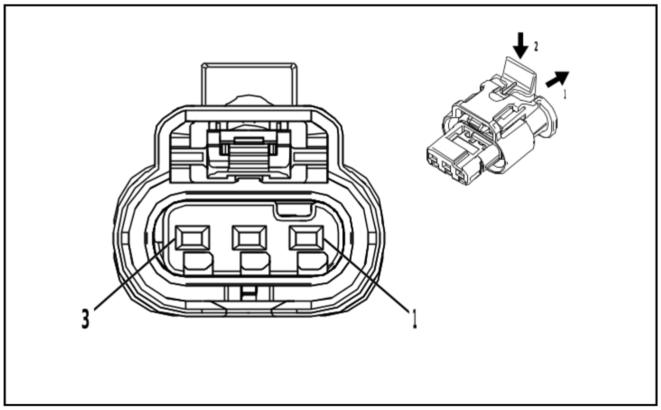
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

B24RF Mobile Telephone Microphone - Right Front

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BU / BK	(1) 7044	(1) Microphone [-] Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) VT / YE	(2) 7043	(2) Microphone [+] Signal	(2) I	(2) —

B26 Crankshaft Position Sensor (L5P)



4249125

Connector Part Information
- Harness Type: Engine Wiring Jumper Harness
- OEM Connector: 13594670
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCP Series, Sealed(BN)

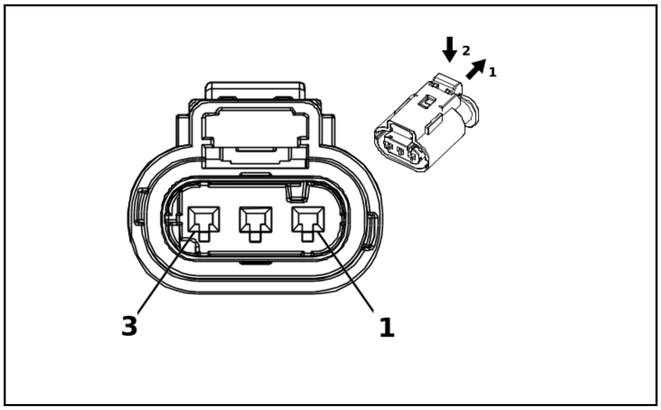
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B26 Crankshaft Position Sensor (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BU	(1) 6270	(1) Crankshaft Position Sensor Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / VT	(2) 6272	(2) Crankshaft Position Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN	(3) 6271	(3) Crankshaft Position Sensor Signal	(3) I	(3) —

B26 Crankshaft Position Sensor (L8T)



2717069

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 10010341
- Service Connector: 84601390
- Description: 3-Way F 1.2 Multilock Series, Sealed(BK)

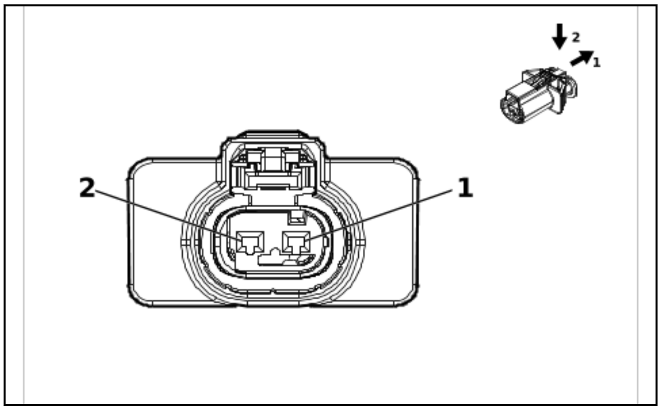
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B26 Crankshaft Position Sensor (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN	(1) 6271	(1) Crankshaft Position Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / VT	(2) 6272	(2) Crankshaft Position Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) VT / BU	(3) 6270	(3) Crankshaft Position Sensor Voltage	(3) I	(3) —

B33 Low Coolant Level Switch



5877143

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 35747313
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MLK Series, Sealed(BK)

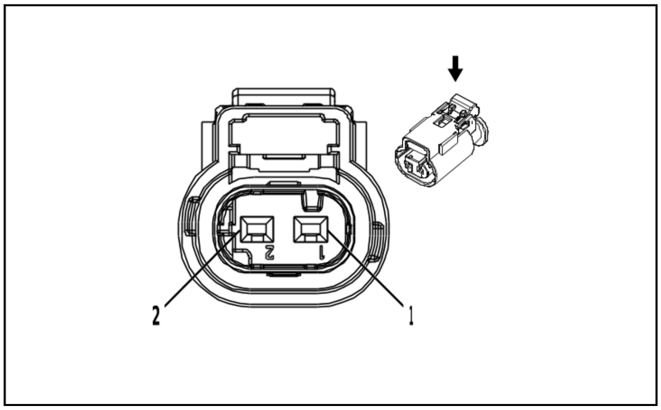
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B33 Low Coolant Level Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU / YE	(1) 68	(1) Low Coolant Level Indicator Control	(1) I	(1) —
(2) 2	(2) 1	(2) BK / WH	(2) 251	(2) Signal Ground	(2) I	(2) —

B34 Engine Coolant Temperature Sensor (L5P)



2717066

Connector Part Information

- Harness Type: Engine Wiring Jumper Harness
- OEM Connector: 13503566
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

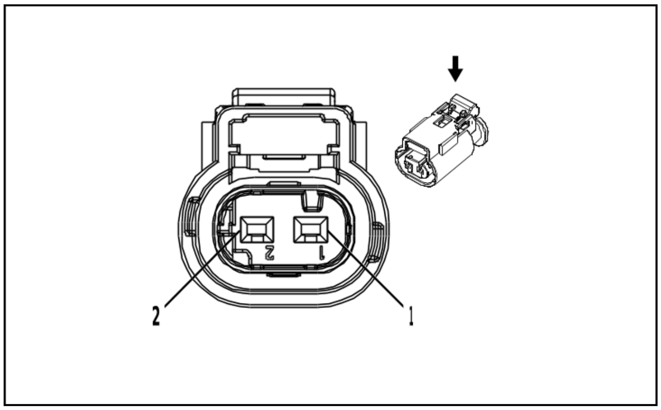
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B34 Engine Coolant Temperature Sensor (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU	(1) 410	(1) Engine Coolant Temperature Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) Engine Control Sensors Low Reference 1	(2) I	(2) —

B34 Engine Coolant Temperature Sensor (L8T)



2717066

Connector Part Information

- Harness Type: Engine Coolant Temperature Sensor Harness
- OEM Connector: 10010337
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

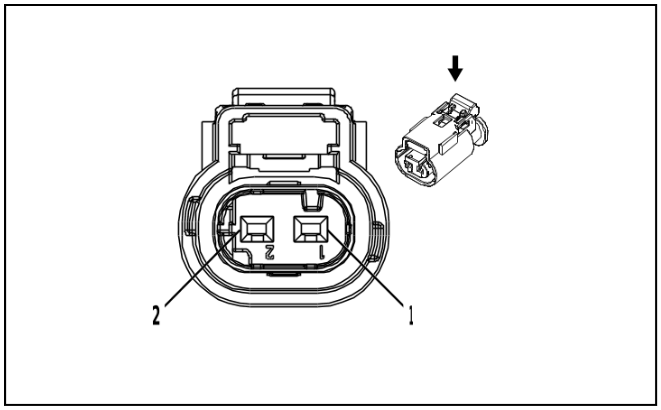
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B34 Engine Coolant Temperature Sensor (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU	(1) 410	(1) Engine Coolant Temperature Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) Engine Control Sensors Low Reference 1	(2) I	(2) —

B35 Engine Oil Level Indicator Switch (L5P)



2717066

Connector Part Information

- Harness Type: Engine Wiring Jumper Harness
- OEM Connector: 13503566
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

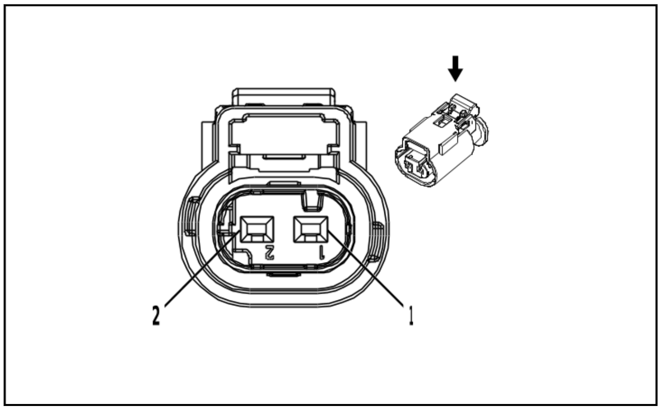
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B35 Engine Oil Level Indicator Switch (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / WH	(1) 6151	(1) Engine Control Module Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 1174	(2) Oil Level Switch Signal	(2) I	(2) —

B35 Engine Oil Level Indicator Switch (L8T)



2717066

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 10010337
- Service Connector: 13587326
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

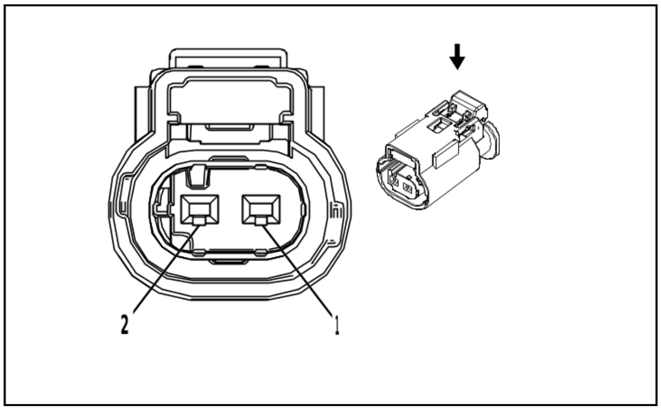
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B35 Engine Oil Level Indicator Switch (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / GN	(1) 1174	(1) Oil Level Switch Signal	(1) I	(1) —
(2) 2	(2) 1	(2) BK / WH	(2) 251	(2) Signal Ground	(2) I	(2) —

B36 Engine Oil Temperature Sensor (L8T)



2830969

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 10010339
- Service Connector: 13587321
- Description: 2-Way F 1.2 Multilock Series, Sealed(D-GY)

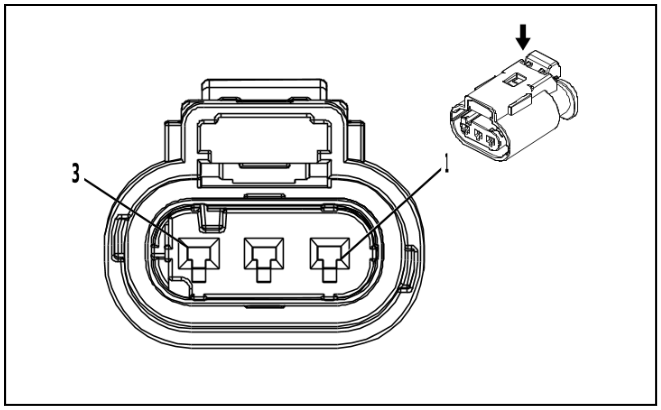
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B36 Engine Oil Temperature Sensor (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / BU	(1) 357	(1) Oil Temperature Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) Engine Control Sensors Low Reference 1	(2) I	(2) —

B37B Engine Oil Pressure Sensor (L5P)



3240107

Connector Part Information

- Harness Type: Engine Wiring Jumper Harness
- OEM Connector: 13503573
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 Multilock Series, Sealed(BK)

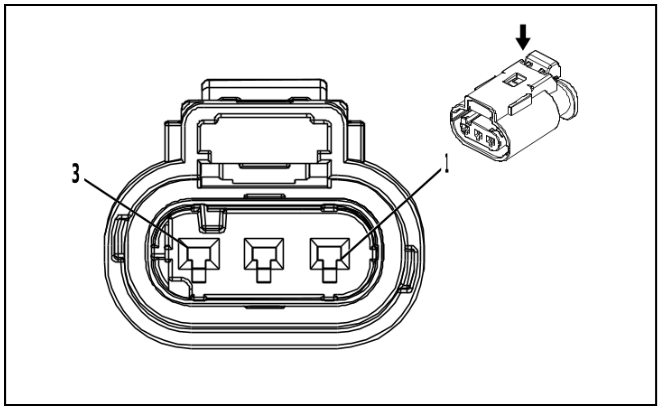
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B37B Engine Oil Pressure Sensor (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE / BN	(1) 331	(1) Oil Pressure Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) Engine Control Sensors Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / RD	(3) 460	(3) Engine Control Sensors 5 Volt Reference 1	(3) I	(3) —

B37B Engine Oil Pressure Sensor (L8T)



3240107

Connector Part Information

- Harness Type: Engine Coolant Temperature Sensor Harness
- OEM Connector: 10010344
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 Multilock Series, Sealed(BK)

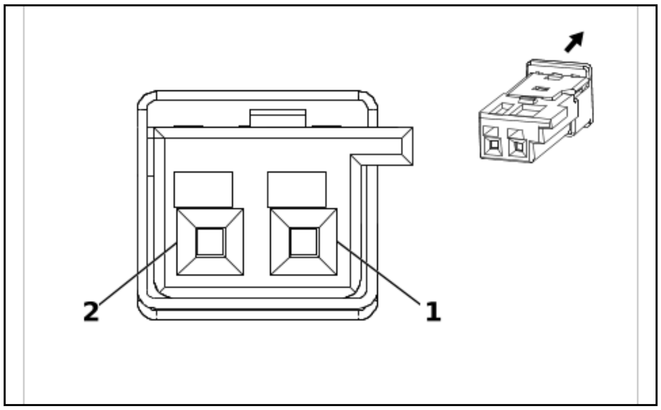
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B37B Engine Oil Pressure Sensor (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE / BN	(1) 331	(1) Oil Pressure Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) Engine Control Sensors Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) WH / RD	(3) 480	(3) Engine Control Vehicle Sensors 5 Volt Reference 1	(3) I	(3) —

B39 Air Conditioning Evaporator Air Temperature Sensor (- CJ2)



2780265

Connector Part Information

- Harness Type: Heater Wiring Harness
- OEM Connector: 13535799
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 0.64 Micro-Quadlock Series(NA)

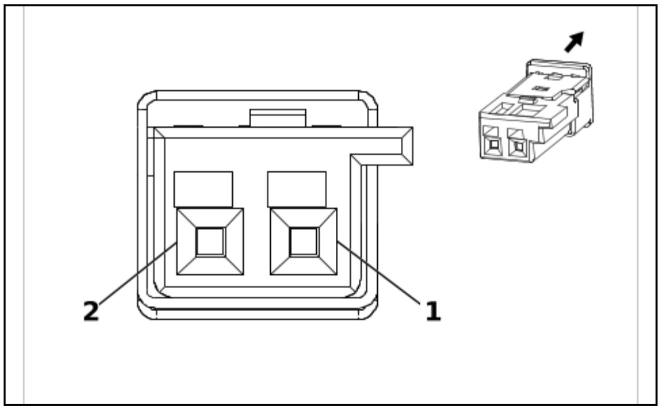
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B39 Air Conditioning Evaporator Air Temperature Sensor (- CJ2)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BN	(1) 105	(1) Ignition Switch Key Out Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) BK / YE	(2) 107	(2) Left Control Module Control	(2) I	(2) —

B39 Air Conditioning Evaporator Air Temperature Sensor (CJ2)



2780265

Connector Part Information

- Harness Type: Heater Wiring Harness
- OEM Connector: 2-1718333-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 0.64 Micro-Quadlock Series(NA)

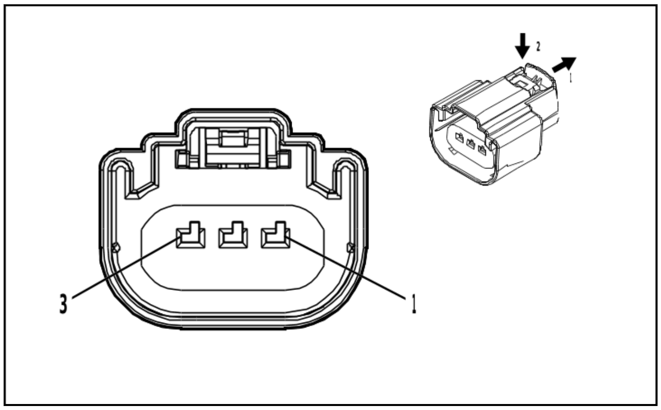
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B39 Air Conditioning Evaporator Air Temperature Sensor (CJ2)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BN	(1) 6137	(1) Air Conditioning Evaporator Temperature Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) BK / YE	(2) 407	(2) Sensor Low Reference	(2) I	(2) —

B47 Fuel Pressure Sensor (- FHS)



4569745

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 160073-3105
- Service Connector: 19179750
- Description: 3-Way F 1.5 MX Series, Sealed(BK)

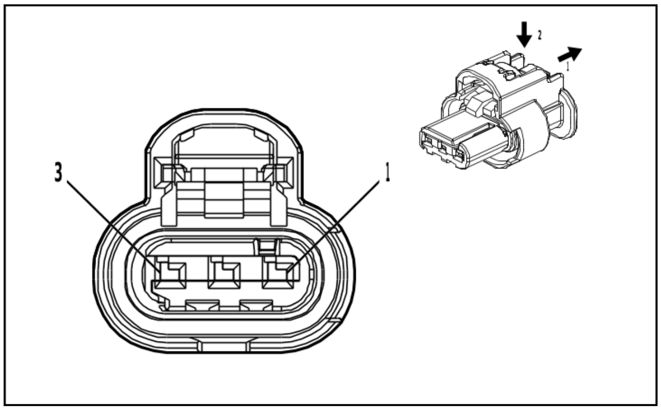
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-2A (GY)	No Tool Required

B47 Fuel Pressure Sensor (- FHS)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75 (1) 0.5	(1) BU / WH (1) BU / WH	(1) 7446 (1) 7446	(1) Fuel Pressure Sensor Signal (1) Fuel Pressure Sensor Signal	(1) II (1) I	(1) N2N (1) - N2N
(2) 2	(2) 0.5	(2) BK / YE	(2) 7447	(2) Fuel Pressure Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) BN / RD	(3) 7445	(3) Fuel Line Pressure Sensor 5V Reference	(3) I	(3) —

B47 Fuel Pressure Sensor (FHS)



4581126

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: 86792094
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

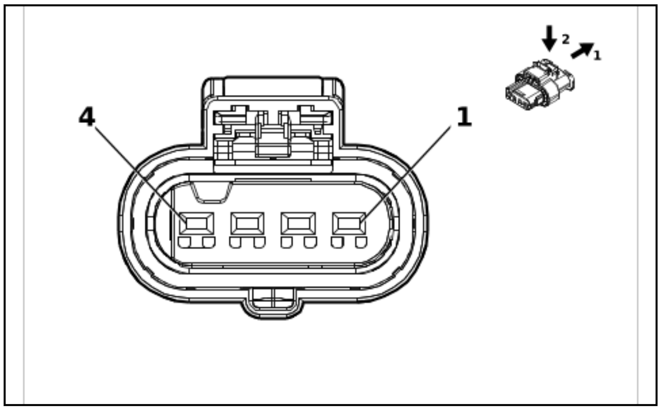
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B47 Fuel Pressure Sensor (FHS)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / RD	(1) 7445	(1) Fuel Line Pressure Sensor 5V Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 7447	(2) Fuel Pressure Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / WH	(3) 7446	(3) Fuel Pressure Sensor Signal	(3) I	(3) —

B47B Fuel Rail Pressure Sensor



5985721

Connector Part Information

- Harness Type: Engine Wiring Jumper Harness
- OEM Connector: 13534801
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 1.2 HPF Series, Sealed(BK)

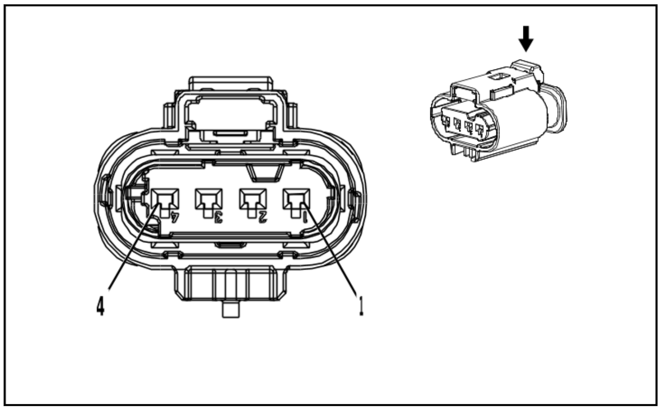
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B47B Fuel Rail Pressure Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / RD	(1) 2917	(1) Fuel Rail Pressure Sensor 5V Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / YE	(2) 2161	(2) Fuel Rail Pressure Sensor 2 Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / GN	(3) 2919	(3) Fuel Rail Pressure Sensor Low Reference	(3) I	(3) —
(4) 4	(4) 0.5	(4) BU / WH	(4) 2918	(4) Fuel Rail Pressure Sensor Signal	(4) I	(4) —

B52C Heated Oxygen Sensor - Bank 1 Sensor 1



4381050

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 10021267
- Service Connector: 85877333
- Description: 4-Way F 1.2 Multilock Series, Sealed(GY)

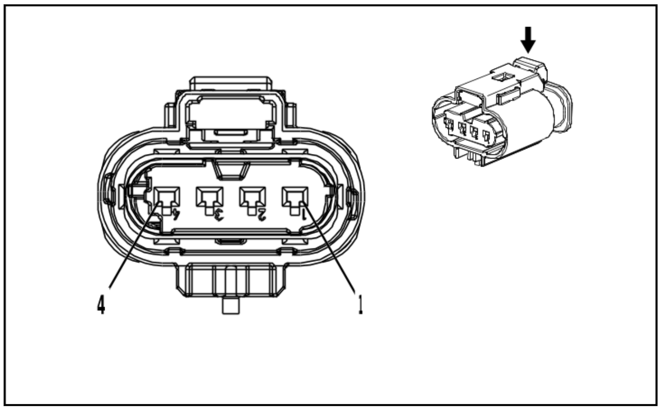
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B52C Heated Oxygen Sensor - Bank 1 Sensor 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / WH	(1) 3113	(1) HO2S Heater Low Control Bank 1 Sensor 1	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / BU	(2) 5293	(2) Powertrain Main Relay Fused Supply Voltage 4	(2) I	(2) —
(3) 3	(3) 0.5	(3) WH / BK	(3) 3111	(3) HO2S Low Signal Bank 1 Sensor 1	(3) I	(3) —
(4) 4	(4) 0.5	(4) VT / GY	(4) 3110	(4) HO2S High Signal Bank 1 Sensor 1	(4) I	(4) —

B52D Heated Oxygen Sensor - Bank 1 Sensor 2



4036370

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 10021266
- Service Connector: 19330920
- Description: 4-Way F 1.2 Multilock Series, Sealed(GY)

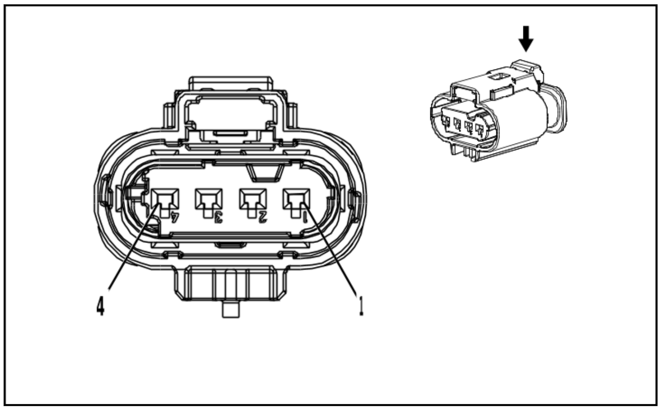
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B52D Heated Oxygen Sensor - Bank 1 Sensor 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / WH	(1) 3122	(1) HO2S Heater Low Control Bank 1 Sensor 2	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / BU	(2) 5294	(2) Powertrain Main Relay Fused Supply Voltage 5	(2) I	(2) —
(3) 3	(3) 0.5	(3) WH / YE	(3) 3121	(3) HO2S Low Signal Bank 1 Sensor 2	(3) I	(3) —
(4) 4	(4) 0.5	(4) BN	(4) 3120	(4) HO2S High Signal Bank 1 Sensor 2	(4) I	(4) —

B52E Heated Oxygen Sensor - Bank 2 Sensor 1



Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 10021267
- Service Connector: 85877333
- Description: 4-Way F 1.2 Multilock Series, Sealed(GY)

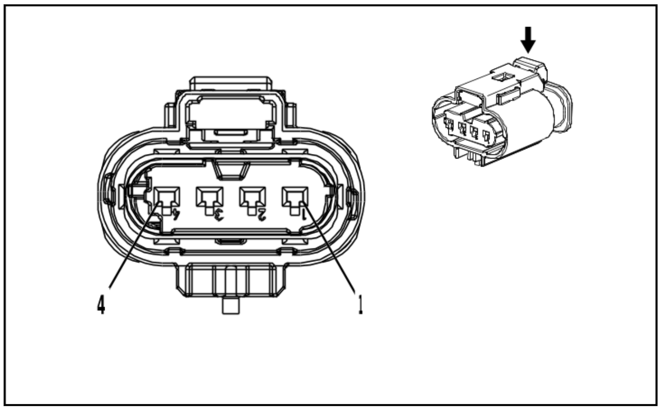
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B52E Heated Oxygen Sensor - Bank 2 Sensor 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / YE	(1) 3212	(1) HO2S Heater Low Control Bank 2 Sensor 1	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / BU	(2) 5293	(2) Powertrain Main Relay Fused Supply Voltage 4	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / WH	(3) 3211	(3) HO2S Low Signal Bank 2 Sensor 1	(3) I	(3) —
(4) 4	(4) 0.5	(4) VT / WH	(4) 3210	(4) HO2S High Signal Bank 2 Sensor 1	(4) I	(4) —

B52F Heated Oxygen Sensor - Bank 2 Sensor 2



4036370

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 10021266
- Service Connector: 19330920
- Description: 4-Way F 1.2 Multilock Series, Sealed(GY)

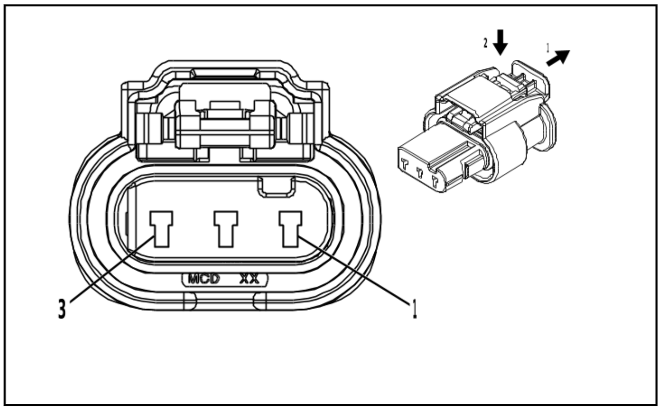
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B52F Heated Oxygen Sensor - Bank 2 Sensor 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / BN	(1) 3223	(1) HO2S Heater Low Control Bank 2 Sensor 2	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / BU	(2) 5294	(2) Powertrain Main Relay Fused Supply Voltage 5	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / BU	(3) 3221	(3) HO2S Low Signal Bank 2 Sensor 2	(3) I	(3) —
(4) 4	(4) 0.5	(4) VT / GN	(4) 3220	(4) HO2S High Signal Bank 2 Sensor 2	(4) I	(4) —

B55 Engine Compartment Cover Switch



4421568

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 34900-3120
- Service Connector: 19368220
- Description: 3-Way F 1.2 MCON-LL Series, Sealed(BK)

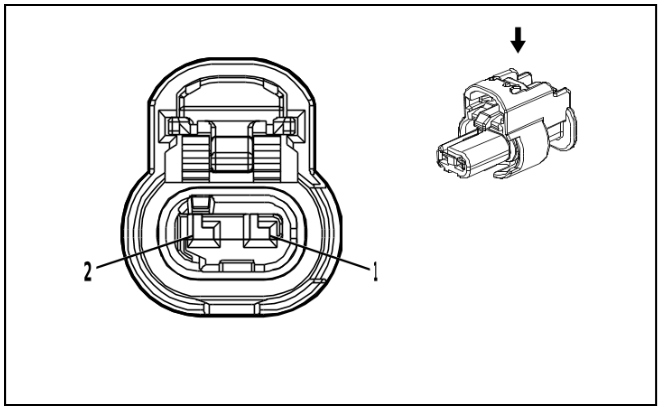
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B55 Engine Compartment Cover Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE	(1) 4063	(1) Hood Status A Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) BN / GN	(2) 4064	(2) Hood Status B Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK	(3) 150	(3) Ground	(3) I	(3) —

B58L Airbag Front End Discriminating Sensor - Left



4690744

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 1-2296694-3
- Service Connector: 19366871
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

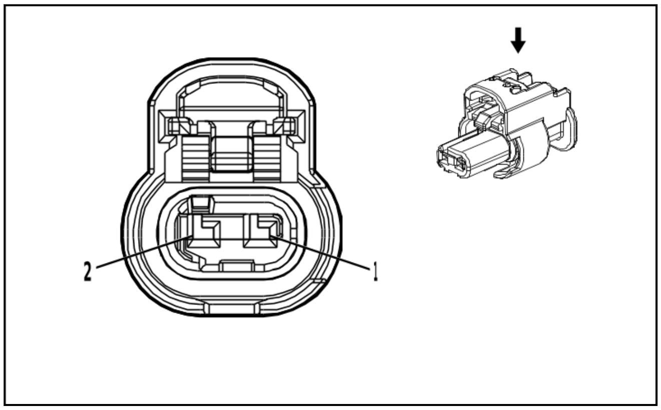
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B58L Airbag Front End Discriminating Sensor - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / YE	(1) 354	(1) Left Front Impact Discriminating Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / OG	(2) 5045	(2) Left Front Impact Discriminating Sensor Low Reference	(2) I	(2) —

B58R Airbag Front End Discriminating Sensor - Right



4690744

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 1-2296694-3
- Service Connector: 19366871
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

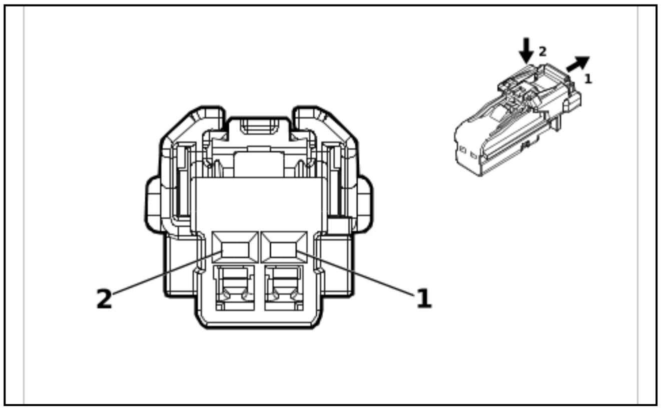
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B58R Airbag Front End Discriminating Sensor - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / GN	(1) 1409	(1) Right Front Impact Discriminating Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / OG	(2) 5600	(2) Right Front Impact Discriminating Sensor Low Reference	(2) I	(2) —

B61P Seat Belt Tension Sensor - Passenger



4115691

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: 87816612
- Description: 2-Way F 1.2 MCON Series(BK)

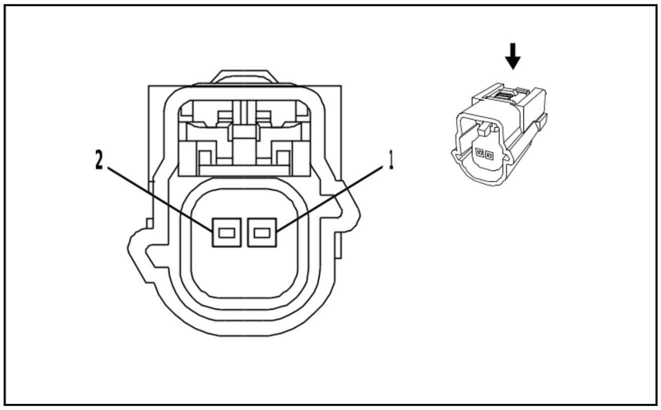
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B61P Seat Belt Tension Sensor - Passenger

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GY / OG	(1) 3946	(1) Passenger Automatic Locking Retractor Switch Low Reference	(1) I	(1) —
(2) 2	(2) 0.35	(2) OG / BN	(2) 3947	(2) Passenger Automatic Locking Retractor Switch Signal	(2) I	(2) —

B63LF Airbag Side Impact Sensor - Left Front Door



2179777

Connector Part Information
- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: 13610095
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 0.64 Series, Sealed(GY)

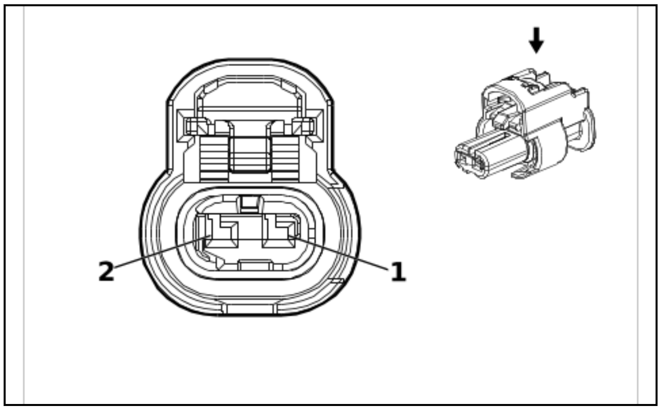
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B63LF Airbag Side Impact Sensor - Left Front Door

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / GN	(1) 2132	(1) Left Front Side Impact Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / OG	(2) 6628	(2) Left Front Side Impact Sensor Low Reference	(2) I	(2) —

B63LR Airbag Side Impact Rear Sensor - Left Door



4335931

Connector Part Information
- Harness Type: Rear Side Door Door Wiring Harness - Left
- OEM Connector: 1-2296694-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

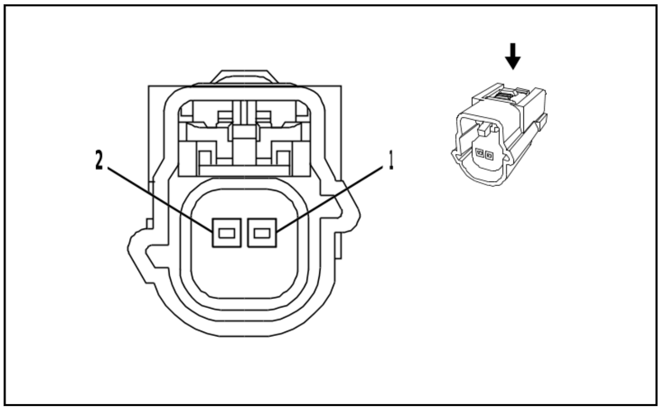
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B63LR Airbag Side Impact Rear Sensor - Left Door

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / BU	(1) 6622	(1) Left Rear Side Impact Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / OG	(2) 6623	(2) Left Rear Side Impact Sensor Low Reference	(2) I	(2) —

B63RF Airbag Side Impact Sensor - Right Front Door



2179777

Connector Part Information
- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 13610095
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 0.64 Series, Sealed(GY)

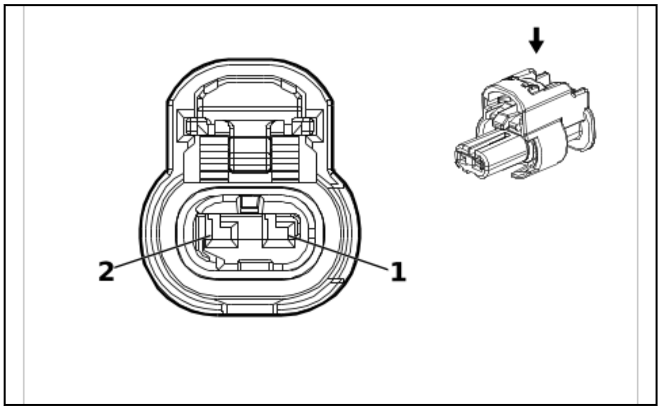
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B63RF Airbag Side Impact Sensor - Right Front Door

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / OG	(1) 2134	(1) Right Front Side Impact Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / OG	(2) 6629	(2) Right Front Side Impact Sensor Low Reference	(2) I	(2) —

B63RR Airbag Side Impact Rear Sensor - Right Door



4335931

Connector Part Information
- Harness Type: Rear Side Door Door Wiring Harness - Right
- OEM Connector: 1-2296694-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

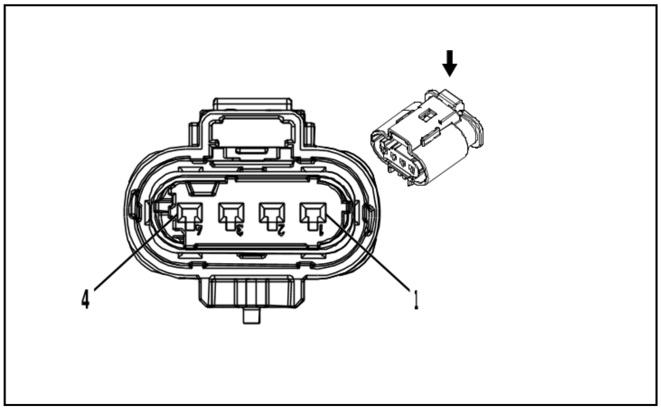
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B63RR Airbag Side Impact Rear Sensor - Right Door

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / WH	(1) 6626	(1) Right Rear Side Impact Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / OG	(2) 6627	(2) Right Rear Side Impact Sensor Low Reference	(2) I	(2) —

B66 Intake Air Temperature Sensor



2717079

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13503575
- Service Connector: 85877329
- Description: 4-Way F 1.2 Multilock Series, Sealed(BK)

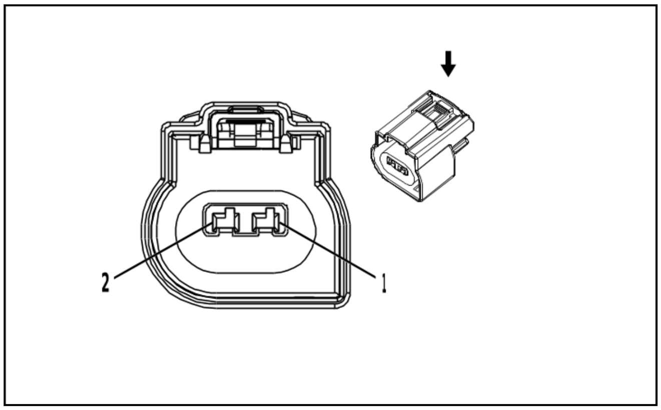
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B66 Intake Air Temperature Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / BU	(1) 7329	(1) Pre-Throttle Air Temperature Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY / RD	(2) 10667	(2) Engine Control Sensors 5 Volt Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / GN	(3) 580	(3) Engine Control Sensors Low Reference 2	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

B68A Knock Sensor 1



2717073

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 34752-0204
- Service Connector: 19301207
- Description: 2-Way F 1.5 MX Series, Sealed(BK)

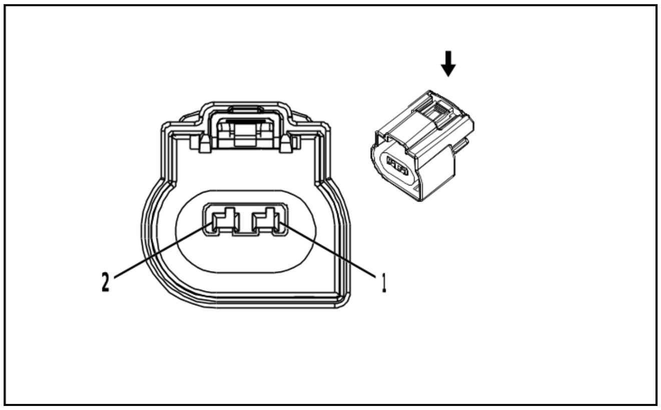
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

B68A Knock Sensor 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / GY	(1) 496	(1) Knock Sensor 1 Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 1716	(2) Knock Sensor Low Reference 1	(2) I	(2) —

B68B Knock Sensor 2



2717073

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 34752-0204
- Service Connector: 19301207
- Description: 2-Way F 1.5 MX Series, Sealed(BK)

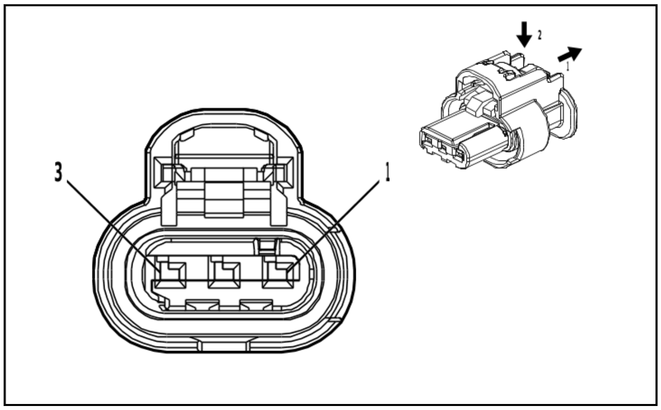
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

B68B Knock Sensor 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / GY	(1) 1876	(1) Knock Sensor 2 Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 2303	(2) Knock Sensor Low Reference 2	(2) I	(2) —

B74 Manifold Absolute Pressure Sensor (L5P)



4581126

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13514590
- Service Connector: 86792094
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

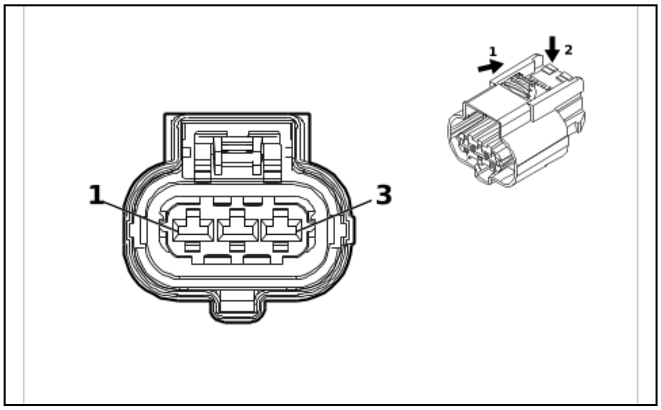
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B74 Manifold Absolute Pressure Sensor (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU / RD	(1) 460	(1) Engine Control Sensors 5 Volt Reference 1	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) Engine Control Sensors Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN / WH	(3) 432	(3) Manifold Absolute Pressure Sensor Signal	(3) I	(3) —

B74 Manifold Absolute Pressure Sensor (L8T)



4900977

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 35133579
- Service Connector: 84815530
- Description: 3-Way F 2.8 CTS Series, Sealed(BK)

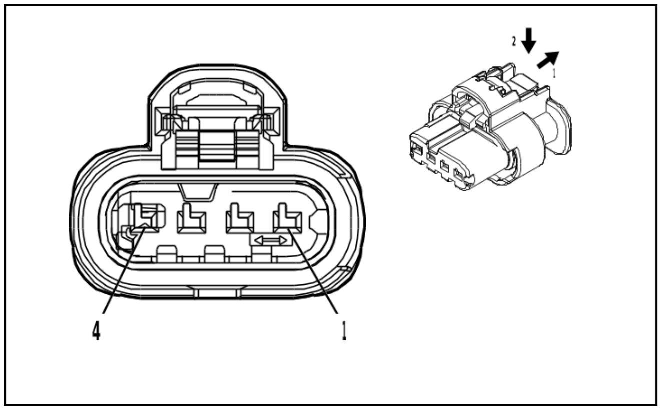
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

B74 Manifold Absolute Pressure Sensor (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / RD	(1) 2704	(1) Manifold Absolute Pressure Sensor 5V Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GN	(2) 469	(2) Manifold Absolute Pressure Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN / WH	(3) 432	(3) Manifold Absolute Pressure Sensor Signal	(3) I	(3) —

B75 Mass Airflow Sensor



4934614

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 1-2296696-2
- Service Connector: 85519071
- Description: 4-Way F 1.2 MCON-CB Series, Sealed(BK)

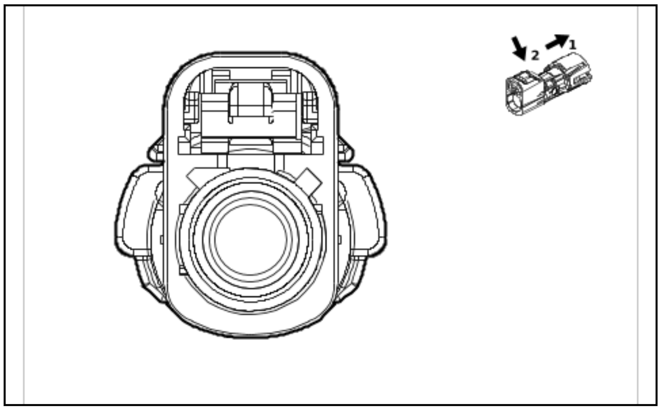
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B75 Mass Airflow Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75 (1) 0.5	(1) VT / BU (1) VT / BU	(1) 5294 (1) 5294	(1) Powertrain Main Relay Fused Supply Voltage 5 (1) Powertrain Main Relay Fused Supply Voltage 5	(1) I (1) I	(1) L5P (1) L8T
(2) 2	(2) 0.5	(2) BU	(2) 492	(2) Mass Air Flow Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN / WH	(3) 4622	(3) Engine Control Module LIN Bus 2	(3) I	(3) —
(4) 4	(4) 0.5 (4) 1	(4) BK / WH (4) BK / WH	(4) 6151 (4) 251	(4) Engine Control Module Ground (4) Signal Ground	(4) I (4) I	(4) L5P (4) L8T

B87 Rearview Driver Information Camera (UV2)



5758030

Connector Part Information

- Harness Type: Endgate Wiring Harness COAX
- OEM Connector: 35187032
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

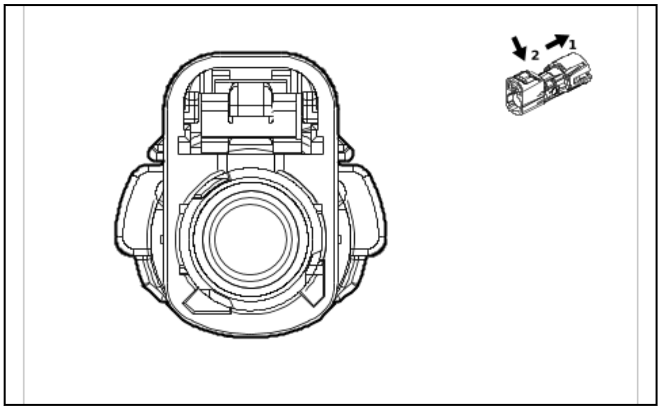
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B87 Rearview Driver Information Camera (UV2)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Rear Vision Camera Coaxial Video Signal	I	—

B87 Rearview Driver Information Camera (UVB)



5757455

Connector Part Information

- Harness Type: Endgate Wiring Harness COAX
- OEM Connector: 35187043
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(OG)

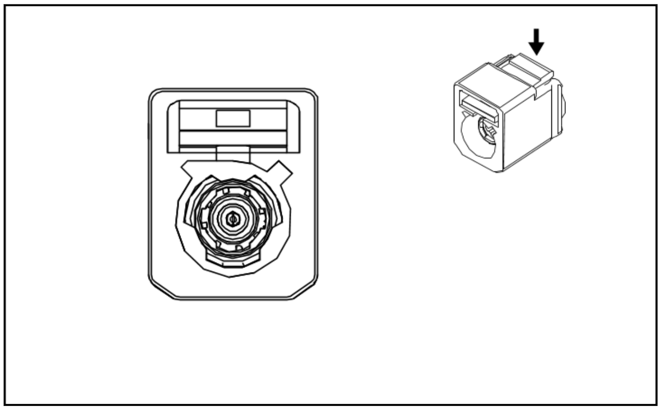
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B87 Rearview Driver Information Camera (UVB)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Rear Vision Camera Coaxial Video Signal	I	—

B87CA Auxiliary Rearview Camera - Cargo Area (UVN)



3293633

Connector Part Information

- Harness Type: Inside Rearview Mirror Wiring Harness COAX
- OEM Connector: 3FA1ENARJ-C01ER
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

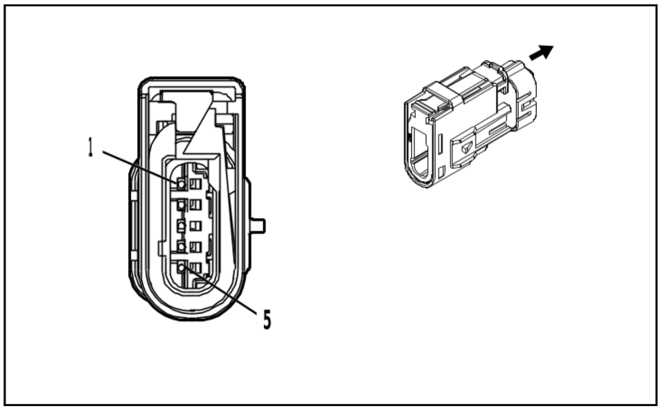
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B87CA Auxiliary Rearview Camera - Cargo Area (UVN)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Cargo Bed Rear Vision Camera Coaxial Video Signal	I	—

B87CA Auxiliary Rearview Camera - Cargo Area (UVO)



4808321

Connector Part Information

- Harness Type: Inside Rearview Mirror Wiring Harness
- OEM Connector: SRVWSB-05A-AH
- Service Connector: Service by Harness - See Part Catalog
- Description: 5-Way M 1.2 Series, Sealed(GY)

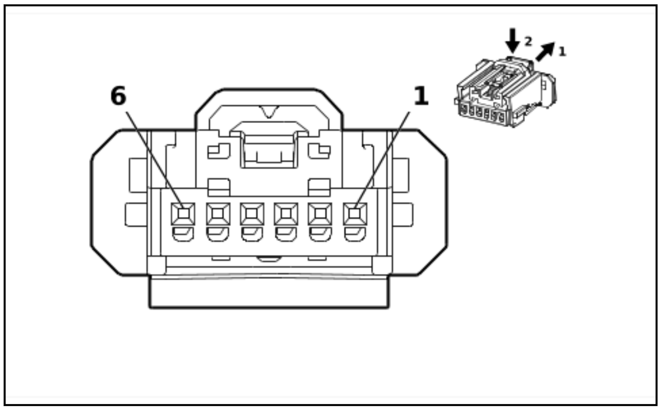
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

B87CA Auxiliary Rearview Camera - Cargo Area (UVO)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GY / YE	(1) 6972	(1) Rearview Camera Signal [+]	(1) I	(1) —
(2) 2	(2) 0.35	(2) WH / BU	(2) 6973	(2) Rearview Camera Signal [-]	(2) I	(2) —
(3) 3	(3) 0.35	(3) BU	(3) 6974	(3) Rearview Camera Low Reference	(3) I	(3) —
(4) 4	(4) 0.35	(4) BK / WH	(4) 851	(4) Signal Ground	(4) I	(4) —
(5) 5	(5) 0.35	(5) VT / GN	(5) 339	(5) Run/Crank Ignition 1 Voltage	(5) I	(5) —

B99 Steering Angle Sensor Module



6171406

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 2292884-5
- Service Connector: 85669157
- Description: 6-Way F 2.0 Gen 50 Series(BK)

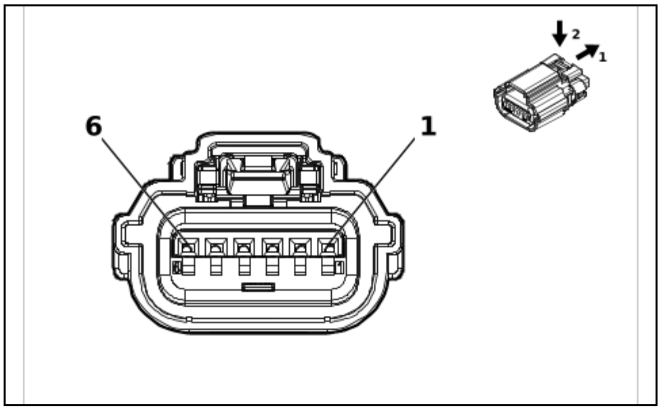
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B99 Steering Angle Sensor Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BU / WH	(1) 10279	(1) Private Steering Angle CAN Bus [-] Serial Data	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) YE	(3) 10280	(3) Private Steering Angle CAN Bus [+] Serial Data	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.35	(5) GN / BN	(5) 2087	(5) Multi-axis Acceleration Sensor Supply Voltage	(5) I	(5) —
(6) 6	(6) 0.35	(6) BK / WH	(6) 851	(6) Signal Ground	(6) I	(6) —

B107 Accelerator Pedal Position Sensor



5921819

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35390637
- Service Connector: 86825466
- Description: 6-Way F 0.64 OCS Series, Sealed(BK)

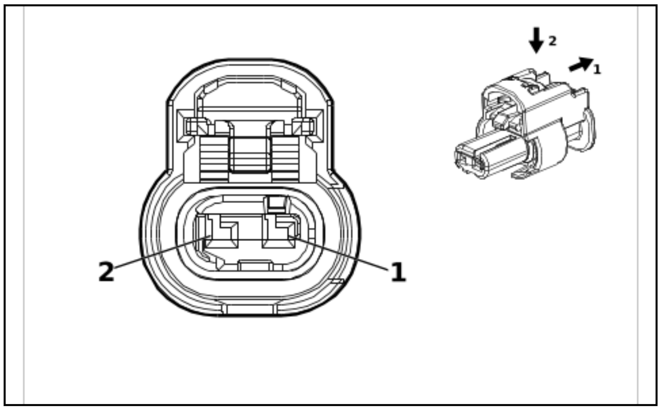
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B107 Accelerator Pedal Position Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) WH / RD	(1) 1164	(1) Accelerator Pedal Position 5V Reference 1	(1) I	(1) —
(2) 2	(2) 0.35	(2) YE / WH	(2) 1161	(2) Accelerator Pedal Position Signal 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK / BU	(3) 1271	(3) Accelerator Pedal Position Low Reference 1	(3) I	(3) —
(4) 4	(4) 0.35	(4) BK / VT	(4) 1272	(4) Accelerator Pedal Position Low Reference 2	(4) I	(4) —
(5) 5	(5) 0.35	(5) GN / WH	(5) 1162	(5) Accelerator Pedal Position Signal 2	(5) I	(5) —
(6) 6	(6) 0.35	(6) BN / RD	(6) 1274	(6) Accelerator Pedal Position 5V Reference 2	(6) I	(6) —

B110 Battery Monitor Module X1



4649903

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 1-2296694-1
- Service Connector: 85761014
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

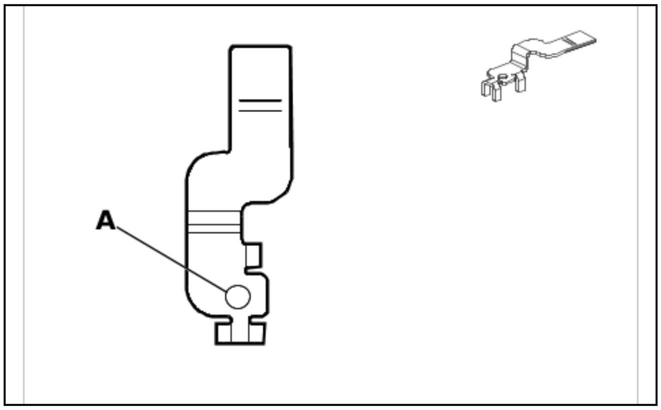
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B110 Battery Monitor Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN / YE	(1) 2855	(1) Body Control Module LIN Bus 9	(1) I	(1) —
(2) 2	(2) 0.75	(2) RD / YE	(2) 2340	(2) Battery Positive Voltage	(2) I	(2) —

B110 Battery Monitor Module X2



6444803

Connector Part Information
- Harness Type: Battery Negative Cable
- OEM Connector: 86816602
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

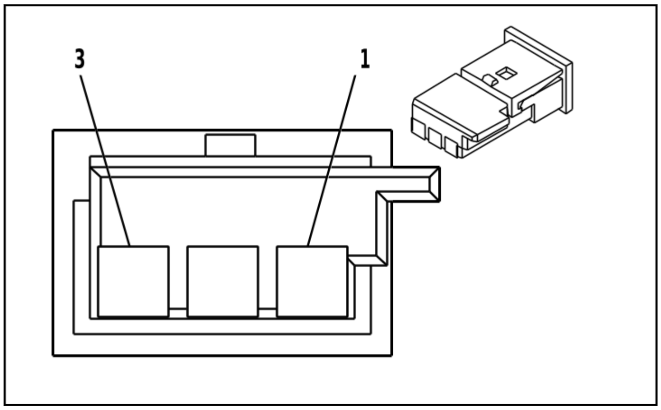
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B110 Battery Monitor Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	50	BK	550	Ground	I	—

B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor



647970

Connector Part Information
- Harness Type: Windshield Outside Moisture_Ambient Light and Humidity Sensor
- OEM Connector: 13153088
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 0.64 Micro-Quadlock Series(BK)

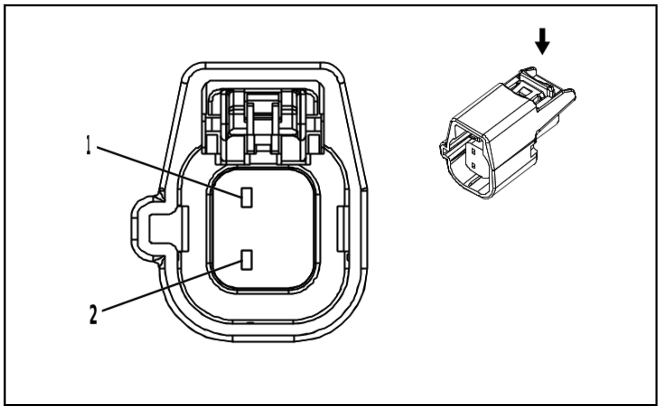
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B117A Windshield Outside Moisture/Ambient Light and Humidity Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) RD / WH	(1) 1340	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.35	(2) GN / BN	(2) 4115	(2) Body Control Module LIN Bus 5	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK	(3) 1050	(3) Ground	(3) I	(3) —

B118 Windshield Washer Solvent Container Level Sensor



3958652

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 7287-8378-40
- Service Connector: 13593220
- Description: 2-Way F 1.5 Series, Sealed(L-GY)

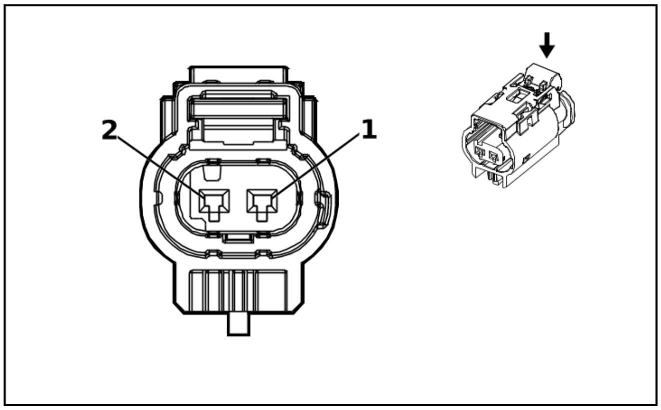
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

B118 Windshield Washer Solvent Container Level Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) VT	(1) 185	(1) Low Washer Fluid Indicator Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 150	(2) Ground	(2) I	(2) —

B130 Exhaust Gas Recirculation Temperature Sensor



5207726

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13583199
- Service Connector: 19332628
- Description: 2-Way F 1.2 Multilock Series, Sealed(GY)

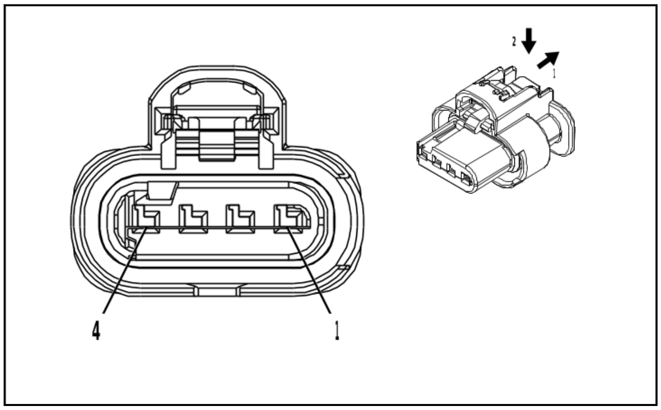
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B130 Exhaust Gas Recirculation Temperature Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE / GN	(1) 3236	(1) Exhaust Gas Recirculation Temperature Sensor 2 Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 6275	(2) Exhaust Gas Recirculation Temperature Sensor 2 Low Reference	(2) I	(2) —

B136 Exhaust Particulate Matter Sensor



4210809

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 1-2296696-1
- Service Connector: 85518225
- Description: 4-Way F 1.2 MCON-CB Series, Sealed(BK)

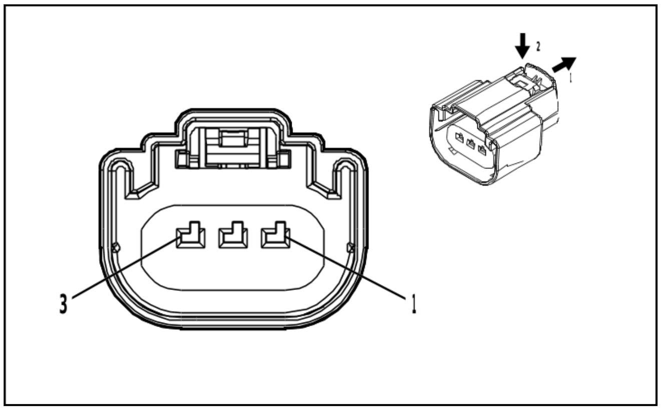
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B136 Exhaust Particulate Matter Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) BK / WH	(1) 1151	(1) Signal Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / GY	(2) 4054	(2) Private Serial Data Powertrain CAN Bus [-] Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) WH	(3) 4055	(3) Private Serial Data Powertrain CAN Bus [+] Serial Data	(3) I	(3) —
(4) 4	(4) 1	(4) VT / GN	(4) 4320	(4) Powertrain Sensor Bus Enable	(4) I	(4) —

B139 Transfer Case Two/Four Wheel Drive Actuator Position Sensor



4569745

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 160073-3105
- Service Connector: 19179750
- Description: 3-Way F 1.5 MX Series, Sealed(BK)

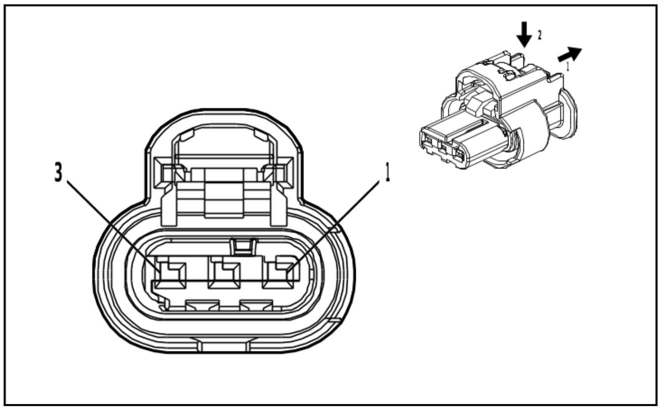
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

B139 Transfer Case Two/Four Wheel Drive Actuator Position Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / RD	(1) 7477	(1) Gear Position Sensor 5V Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / GN	(2) 7479	(2) Rotary Position Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / BK	(3) 7478	(3) Gear Position Sensor Low Reference	(3) I	(3) —

B150 Fuel Tank Pressure Sensor (- N2N)



4778903

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 1-2296695-2
- Service Connector: 86792095
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

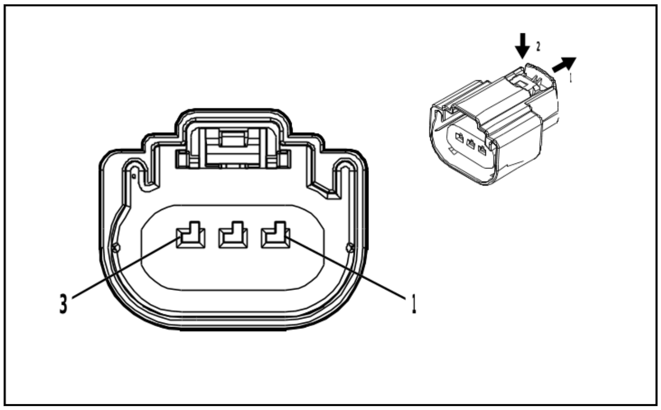
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B150 Fuel Tank Pressure Sensor (- N2N)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU / GN	(1) 890	(1) Fuel Tank Pressure Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / BN	(2) 6284	(2) Fuel Tank Pressure Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / RD	(3) 2709	(3) Fuel Tank Pressure Sensor 5V Reference	(3) I	(3) —

B150 Fuel Tank Pressure Sensor (L8T & N2N)



4589538

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 160073-3106
- Service Connector: 84569854
- Description: 3-Way F 1.5 MX Series, Sealed(GY)

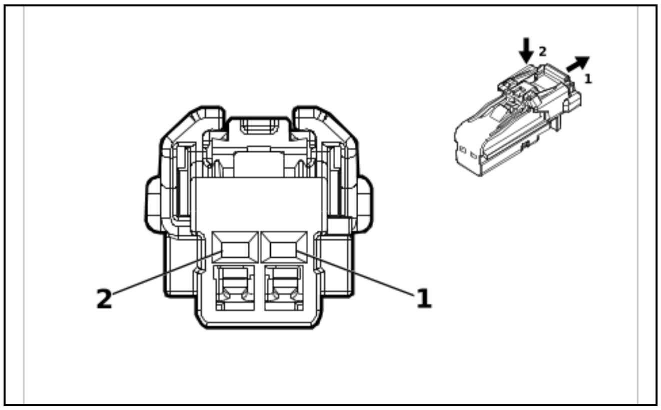
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

B150 Fuel Tank Pressure Sensor (L8T & N2N)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU / GN	(1) 890	(1) Fuel Tank Pressure Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / BN	(2) 6284	(2) Fuel Tank Pressure Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / RD	(3) 2709	(3) Fuel Tank Pressure Sensor 5V Reference	(3) I	(3) —

B153D Front Seat Belt Buckle - Driver



4115691

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

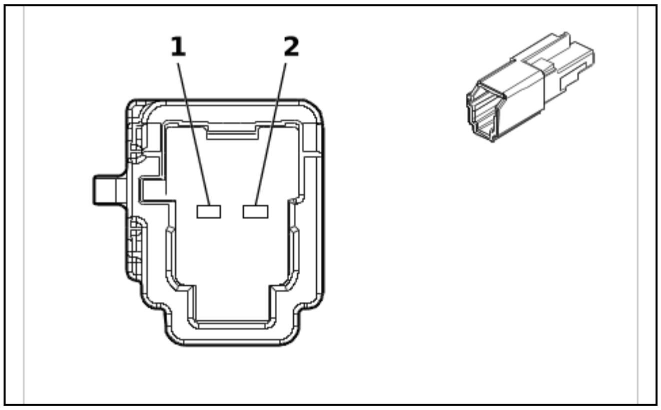
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B153D Front Seat Belt Buckle - Driver

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / OG	(1) 1363	(1) Driver Seat Belt Switch Low Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) OG / BN	(2) 238	(2) Driver Seat Belt Switch Signal	(2) I	(2) —

B153LR Rear Seat Belt Buckle - Left



6529124

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 6099-0610
- Service Connector: 85725003
- Description: 2-Way M 1.2 MBS Series(BK)

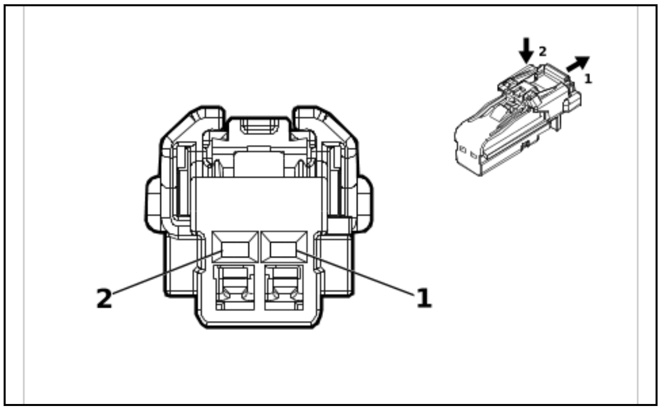
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

B153LR Rear Seat Belt Buckle - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / OG	(1) 1363	(1) Driver Seat Belt Switch Low Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / OG	(2) 5161	(2) Left Rear Seat Belt Switch Signal	(2) I	(2) —

B153P Front Seat Belt Buckle - Passenger



4115691

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

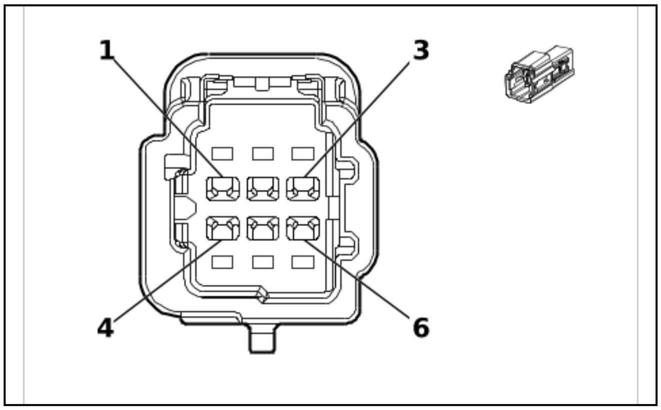
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B153P Front Seat Belt Buckle - Passenger

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / OG	(1) 1363	(1) Driver Seat Belt Switch Low Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) OG / VT	(2) 1362	(2) Passenger Seat Belt Switch Signal	(2) I	(2) —

B153RR Rear Seat Belt Buckle - Right



5714613

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 6098-9120
- Service Connector: 86825467
- Description: 6-Way M 1.2 MBS Series(BK)

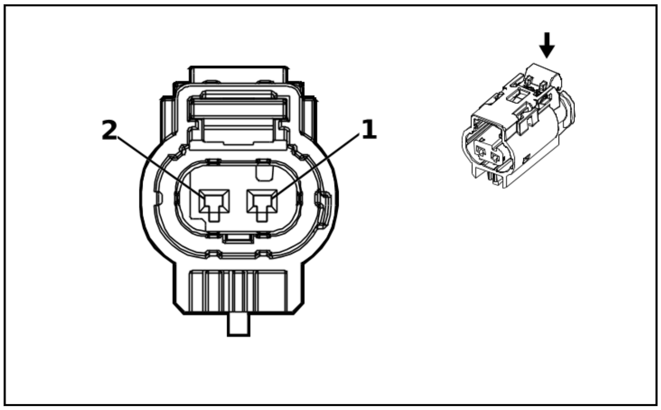
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

B153RR Rear Seat Belt Buckle - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.5	(2) BU / OG	(2) 5163	(2) Rear Center Seat Belt Switch Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / OG	(3) 1363	(3) Driver Seat Belt Switch Low Reference	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) BN / OG	(5) 5162	(5) Right Rear Seat Belt Switch Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) BK / OG	(6) 1363	(6) Driver Seat Belt Switch Low Reference	(6) I	(6) —

B172LF Front Disc Brake Pad Wear Sensor - Left



3747581

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 10094234
- Service Connector: 84727362
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

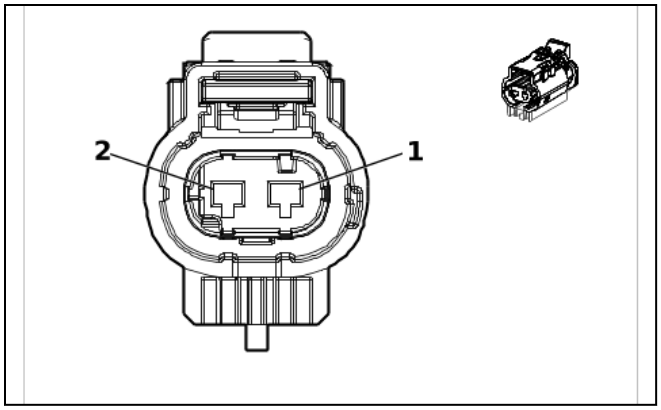
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B172LF Front Disc Brake Pad Wear Sensor - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / BU	(1) 1602	(1) Front Brake Pad Wear Sensor Signal	(1) I	(1) —
(2) 2	(2) 1	(2) BK / WH	(2) 1151	(2) Signal Ground	(2) I	(2) —

B172LR Rear Disc Brake Pad Wear Sensor - Left



6819415

Connector Part Information
- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: 13551877
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MLK Series, Sealed(BK)

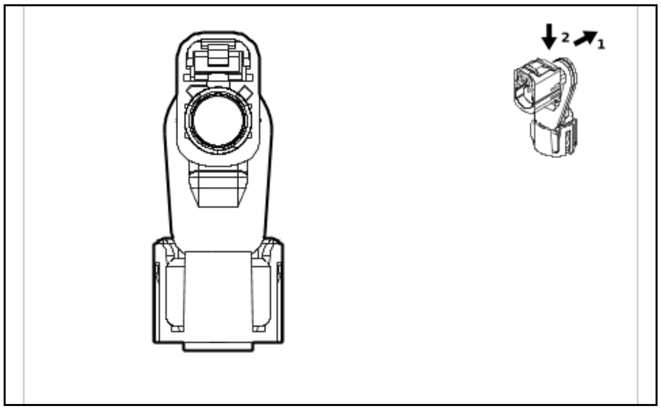
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B172LR Rear Disc Brake Pad Wear Sensor - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN / YE	(1) 1616	(1) Rear Brake Pad Wear Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.75	(2) BK / WH	(2) 1751	(2) Signal Ground	(2) I	(2) —

B174G Front View Driver Information Camera - Grille



5920539

Connector Part Information

- Harness Type: Front View Camera Switch Wiring Harness COAX
- OEM Connector: 13537644
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

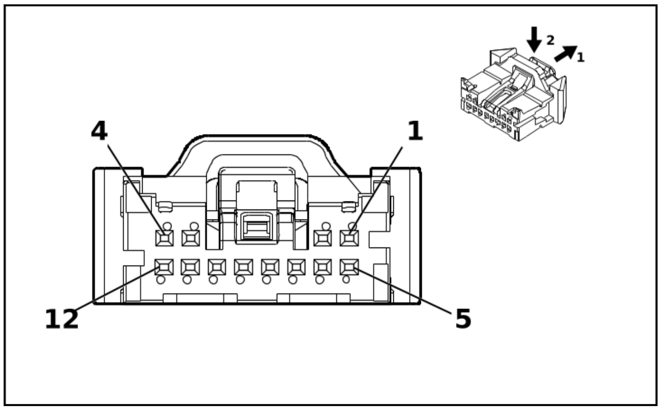
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B174G Front View Driver Information Camera - Grille

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Front Vision Camera 1 Coaxial Video Signal	I	—

B174W Front View Camera - Windshield



5360826

Connector Part Information

- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 35068239
- Service Connector: 13529935
- Description: 12-Way F 050 CTS Series(BK)

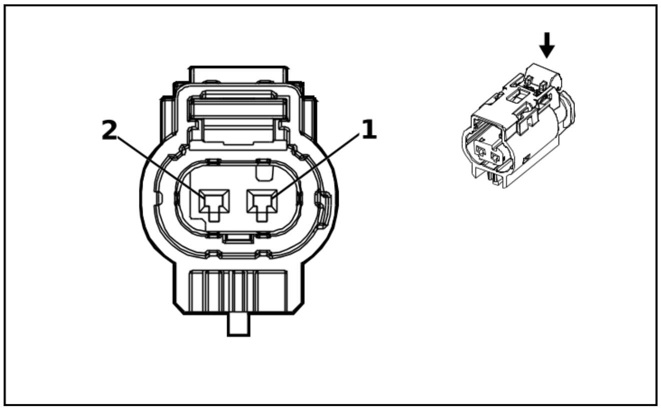
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84944580	EL-35616-58 (BK)	EL-38125-58

B174W Front View Camera - Windshield

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK / WH	(1) 851	(1) Signal Ground	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) RD / YE	(3) 240	(3) Battery Positive Voltage	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.35	(5) BU / YE	(5) 4979	(5) AUTOSAR CAN Bus [+] 2 Serial Data	(5) I	(5) —
(6) 6	(6) 0.35	(6) WH	(6) 4978	(6) AUTOSAR CAN Bus [-] 2 Serial Data	(6) I	(6) —
(7) 7	(7) 0.35	(7) BU / YE	(7) 4979	(7) AUTOSAR CAN Bus [+] 2 Serial Data	(7) I	(7) —
(8) 8	(8) 0.35	(8) WH	(8) 4978	(8) AUTOSAR CAN Bus [-] 2 Serial Data	(8) I	(8) —
9 - 12	—	—	—	Not Occupied	—	—

B193A Charge Air Cooler Air Temperature Sensor - Inlet



3747581

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13583195
- Service Connector: 84727362
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

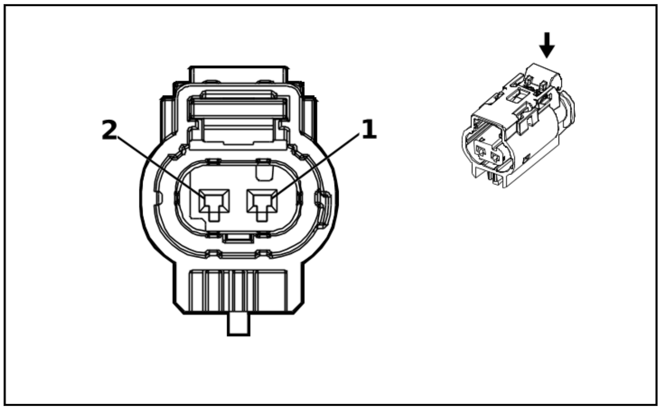
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B193A Charge Air Cooler Air Temperature Sensor - Inlet

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / GN	(1) 580	(1) Engine Control Sensors Low Reference 2	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN	(2) 3683	(2) Charge Air Cooler Inlet Temperature Sensor Signal	(2) I	(2) —

B193B Charge Air Cooler Air Temperature Sensor - Outlet



3747581

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 10094234
- Service Connector: 84727362
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

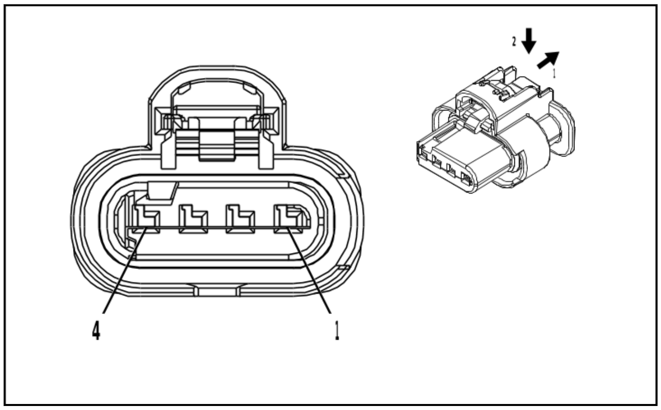
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B193B Charge Air Cooler Air Temperature Sensor - Outlet

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / BU	(1) 10597	(1) Engine Control Sensors Low Reference 3	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN	(2) 3681	(2) Charge Air Cooler Outlet Temperature Sensor Signal	(2) I	(2) —

B195A Nitrogen Oxides Sensor 1



4210809

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 1-2296696-1
- Service Connector: 85518225
- Description: 4-Way F 1.2 MCON-CB Series, Sealed(BK)

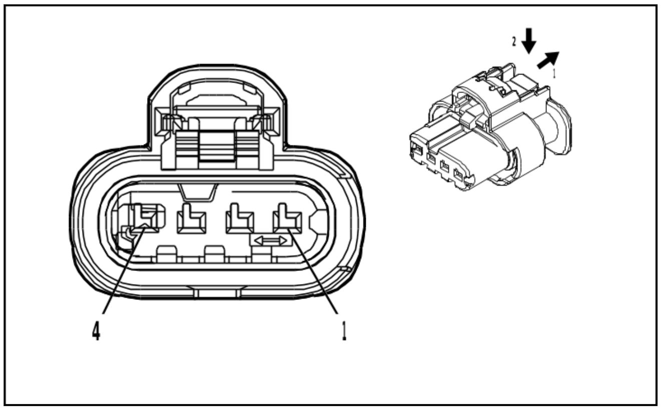
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B195A Nitrogen Oxides Sensor 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / GN	(1) 4320	(1) Powertrain Sensor Bus Enable	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH	(2) 4055	(2) Private Serial Data Powertrain CAN Bus [+] Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / GY	(3) 4054	(3) Private Serial Data Powertrain CAN Bus [-] Serial Data	(3) I	(3) —
(4) 4	(4) 0.75	(4) BK / WH	(4) 1151	(4) Signal Ground	(4) I	(4) —

B195B Nitrogen Oxides Sensor 2



4934614

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 1-2296696-2
- Service Connector: 85519071
- Description: 4-Way F 1.2 MCON-CB Series, Sealed(BK)

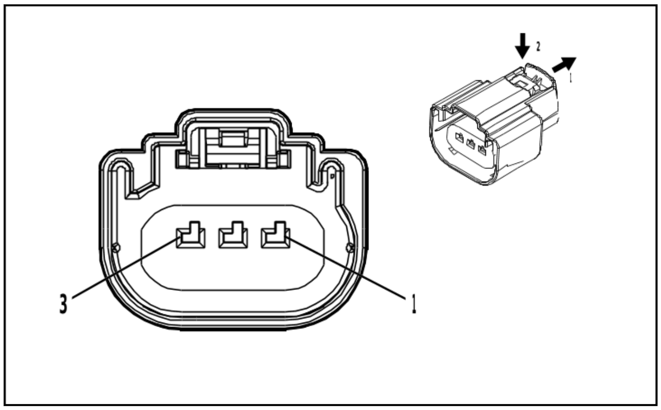
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B195B Nitrogen Oxides Sensor 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) VT / GN	(1) 4320	(1) Powertrain Sensor Bus Enable	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH	(2) 4055	(2) Private Serial Data Powertrain CAN Bus [+] Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / GY	(3) 4054	(3) Private Serial Data Powertrain CAN Bus [-] Serial Data	(3) I	(3) —
(4) 4	(4) 1	(4) BK / WH	(4) 1151	(4) Signal Ground	(4) I	(4) —

B198 Fuel Composition Sensor



4829227

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 160073-3107
- Service Connector: 19371197
- Description: 3-Way F 1.5 MX Series, Sealed(GY)

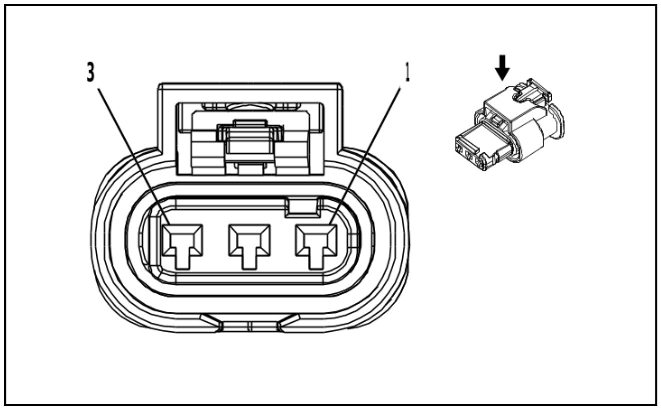
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

B198 Fuel Composition Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / GN	(1) 4320	(1) Powertrain Sensor Bus Enable	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 3802	(2) Fuel Composition Sensor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) VT / BN	(3) 3803	(3) Fuel Composition Sensor Signal	(3) I	(3) —

B212 Reductant Tank Fluid Sensor



2750649

Connector Part Information
- Harness Type: Emission Reduction Fluid Tank Reservoir Wire Harness
- OEM Connector: 1-1718644-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON Series, Sealed(BK)

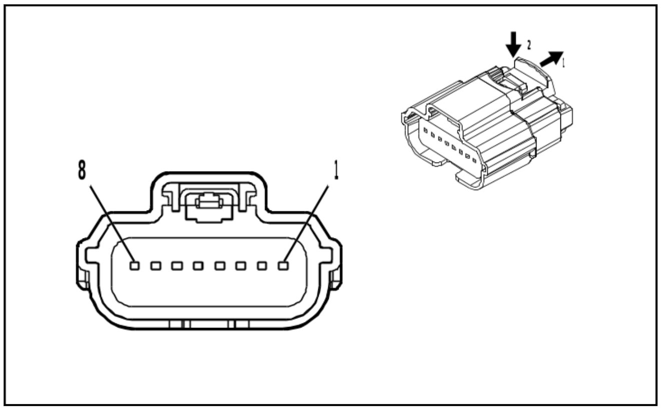
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B212 Reductant Tank Fluid Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 7290	(1) Diesel Exhaust Fluid Sensor Voltage Reference 1	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / GN	(2) 7284	(2) Diesel Exhaust Fluid Liquid Quality Temperature Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / YE	(3) 8434	(3) Diesel Exhaust Fluid Sensor Low Reference	(3) I	(3) —

B218L Side Obstacle Detection Control Module - Left



4708234

Connector Part Information

- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 31404-9110
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 64 Series, Sealed(BK)

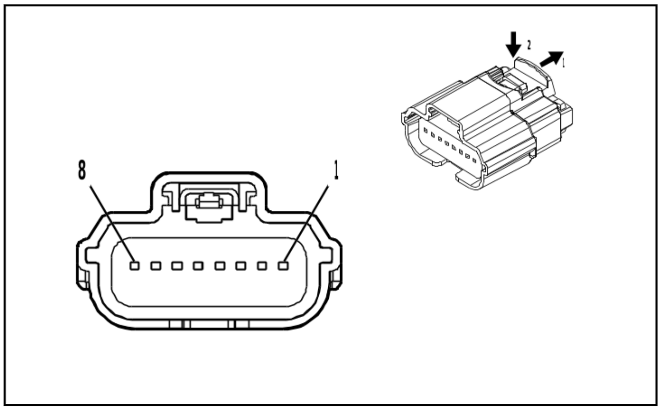
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B218L Side Obstacle Detection Control Module - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 4087	(1) Private Serial Data Side Obstacle Detection CAN Bus [-] Serial Data	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / VT	(2) 4088	(2) Private Serial Data Side Obstacle Detection CAN Bus [+] Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / WH	(3) 1951	(3) Signal Ground	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 4100	(4) AUTOSAR CAN Bus [-] 4 Serial Data	(4) I	(4) —
(5) 5	(5) 0.5	(5) WH	(5) 4100	(5) AUTOSAR CAN Bus [-] 4 Serial Data	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / VT	(6) 4101	(6) AUTOSAR CAN Bus [+] 4 Serial Data	(6) I	(6) —
(7) 7	(7) 0.5	(7) BU / VT	(7) 4101	(7) AUTOSAR CAN Bus [+] 4 Serial Data	(7) I	(7) —
(8) 8	(8) 0.5	(8) RD / GN	(8) 6940	(8) Battery Positive Voltage	(8) I	(8) —

B218R Side Obstacle Detection Control Module - Right



4708234

Connector Part Information

- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 31404-9532
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 64 Series, Sealed(BK)

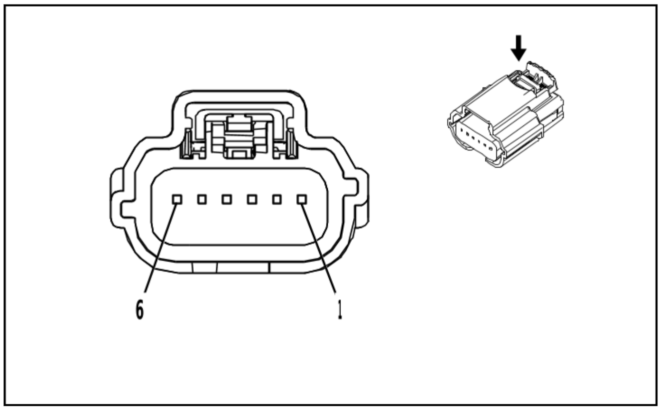
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B218R Side Obstacle Detection Control Module - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 4087	(1) Private Serial Data Side Obstacle Detection CAN Bus [-] Serial Data	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / VT	(2) 4088	(2) Private Serial Data Side Obstacle Detection CAN Bus [+] Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / WH	(3) 1951	(3) Signal Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) WH	(5) 4100	(5) AUTOSAR CAN Bus [-] 4 Serial Data	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / VT	(6) 4101	(6) AUTOSAR CAN Bus [+] 4 Serial Data	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.5	(8) RD / GN	(8) 6940	(8) Battery Positive Voltage	(8) I	(8) —

B302 Steering Gear Pressure Sensor



2871903

Connector Part Information

- Harness Type: Power Steering Control Module Wiring Harness
- OEM Connector: 31404-7213
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 64 Series, Sealed(GY)

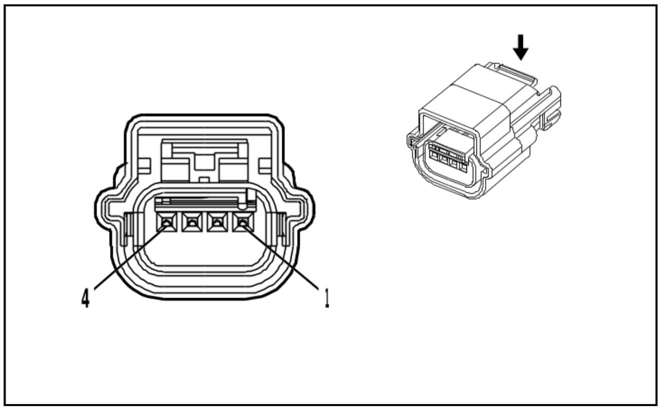
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B302 Steering Gear Pressure Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) —	(2) RD	(2) 3130	(2) Steering Hydraulic Pressure Sensor 5 Volt Reference	(2) I	(2) —
(3) 3	(3) —	(3) GN	(3) 3129	(3) Steering Hydraulic Pressure Sensor Right Signal	(3) I	(3) —
(4) 4	(4) —	(4) WH	(4) 3128	(4) Steering Hydraulic Pressure Sensor Left Signal	(4) I	(4) —
(5) 5	(5) —	(5) BK	(5) 8023	(5) Hydraulic Pressure Sensor Low Reference	(5) I	(5) —
6	—	—	—	Not Occupied	—	—

B303 Transmission Range Sensor



4789353

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 6006314801
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Series, Sealed(BK)

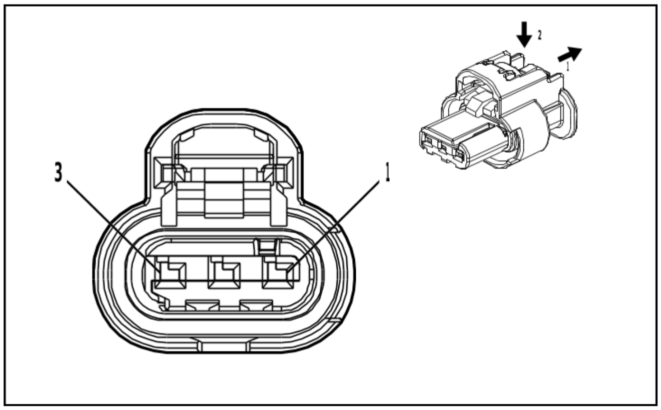
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

B303 Transmission Range Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / GY	(1) 0	(1) —	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE	(2) 0	(2) —	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / GY	(3) 0	(3) —	(3) I	(3) —
(4) 4	(4) 0.5	(4) OG	(4) 0	(4) —	(4) I	(4) —

B306A Parking Assist Alarm Sensor - Front Left Outer



4581126

Connector Part Information
- Harness Type: Front Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

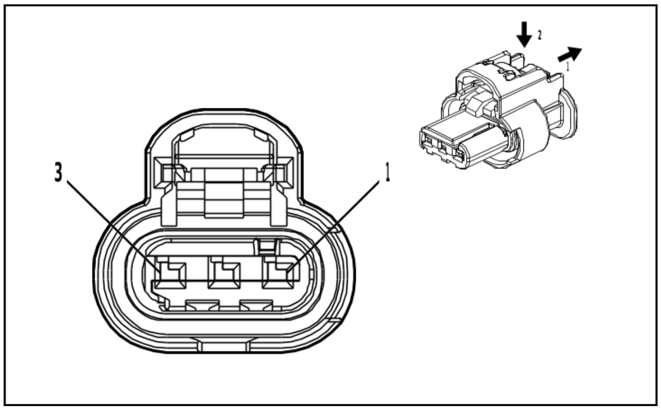
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B306A Parking Assist Alarm Sensor - Front Left Outer

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 6581	(1) Front Parking Assist Display Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / WH	(2) 5215	(2) Left Front Outer Parking Assist Sensor	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / BU	(3) 5214	(3) Front Parking Assist Sensor Low Reference	(3) I	(3) —

B306B Parking Assist Alarm Sensor - Front Left Middle



4581126

Connector Part Information

- Harness Type: Front Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

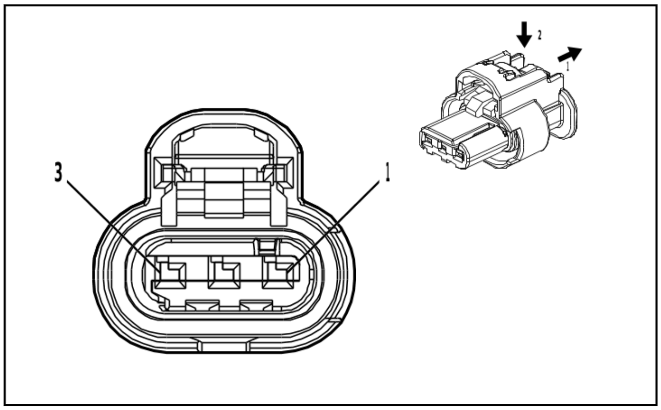
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B306B Parking Assist Alarm Sensor - Front Left Middle

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 6581	(1) Front Parking Assist Display Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / GY	(2) 5216	(2) Left Front Middle Parking Assist Sensor	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / BU	(3) 5214	(3) Front Parking Assist Sensor Low Reference	(3) I	(3) —

B306C Parking Assist Alarm Sensor - Front Right Middle



4581126

Connector Part Information

- Harness Type: Front Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

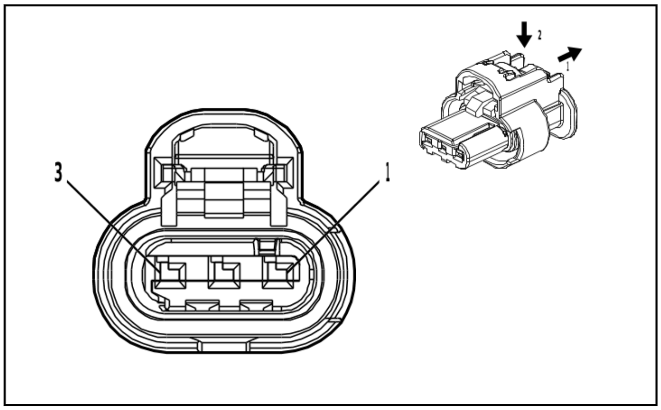
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B306C Parking Assist Alarm Sensor - Front Right Middle

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 6581	(1) Front Parking Assist Display Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / GY	(2) 5218	(2) Right Front Middle Parking Assist Sensor	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / BU	(3) 5214	(3) Front Parking Assist Sensor Low Reference	(3) I	(3) —

B306D Parking Assist Alarm Sensor - Front Right Outer



4581126

Connector Part Information
- Harness Type: Front Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

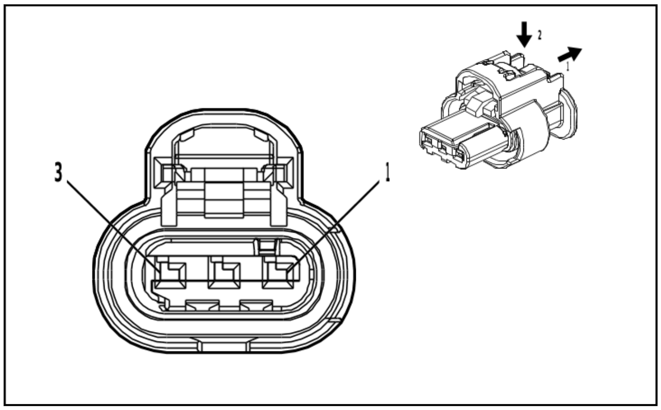
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B306D Parking Assist Alarm Sensor - Front Right Outer

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 6581	(1) Front Parking Assist Display Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / GY	(2) 5217	(2) Right Front Outer Parking Assist Sensor	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / BU	(3) 5214	(3) Front Parking Assist Sensor Low Reference	(3) I	(3) —

B306E Parking Assist Alarm Sensor - Rear Left Outer



4581126

Connector Part Information

- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

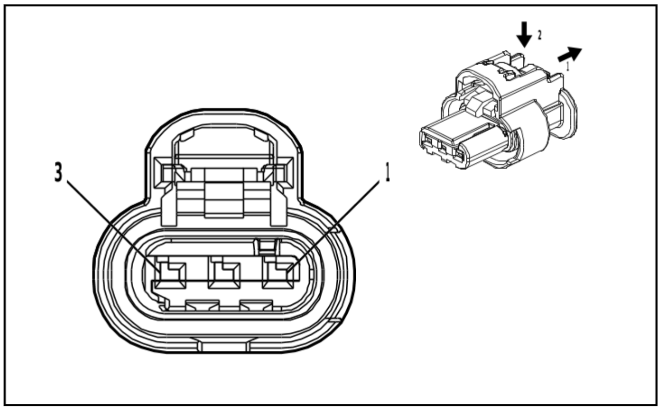
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B306E Parking Assist Alarm Sensor - Rear Left Outer

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / WH	(1) 2374	(1) Object Sensor Voltage Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE	(2) 2375	(2) Left Rear Outer Parking Assist Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / GY	(3) 2379	(3) Object Sensor Low Reference	(3) I	(3) —

B306F Parking Assist Alarm Sensor - Rear Left Middle



4581126

Connector Part Information

- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

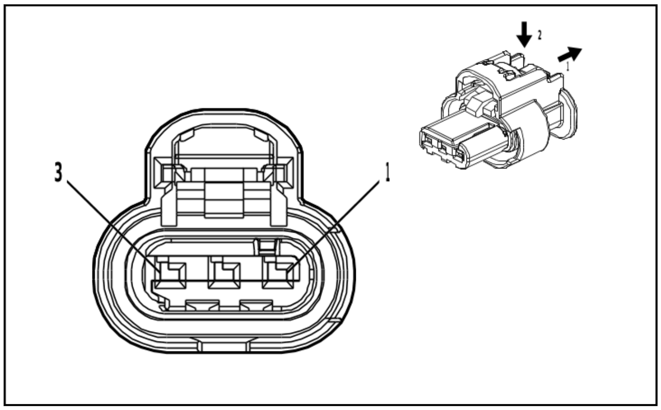
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B306F Parking Assist Alarm Sensor - Rear Left Middle

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / WH	(1) 2374	(1) Object Sensor Voltage Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / BU	(2) 2376	(2) Left Rear Middle Parking Assist Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / GY	(3) 2379	(3) Object Sensor Low Reference	(3) I	(3) —

B306G Parking Assist Alarm Sensor - Rear Right Middle



4581126

Connector Part Information
- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

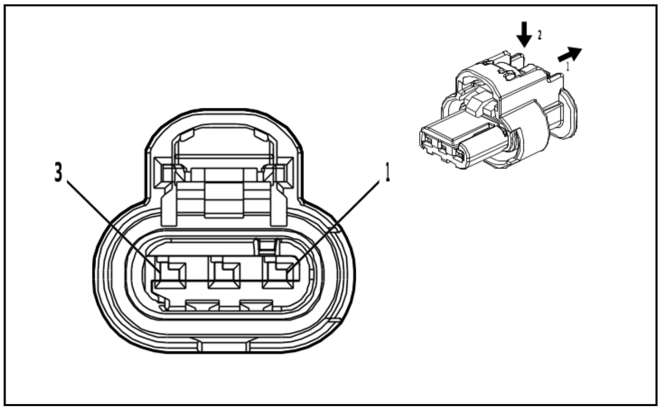
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B306G Parking Assist Alarm Sensor - Rear Right Middle

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / WH	(1) 2374	(1) Object Sensor Voltage Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / WH	(2) 2377	(2) Right Rear Middle Parking Assist Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / GY	(3) 2379	(3) Object Sensor Low Reference	(3) I	(3) —

B306H Parking Assist Alarm Sensor - Rear Right Outer



4581126

Connector Part Information

- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

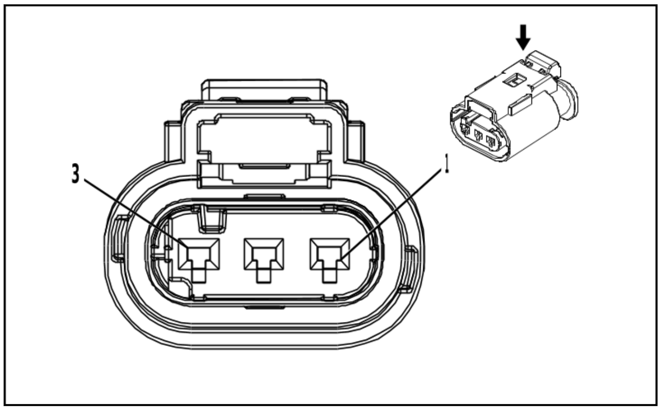
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B306H Parking Assist Alarm Sensor - Rear Right Outer

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / WH	(1) 2374	(1) Object Sensor Voltage Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / VT	(2) 2378	(2) Right Rear Outer Parking Assist Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / GY	(3) 2379	(3) Object Sensor Low Reference	(3) I	(3) —

B310 Fuel Pressure and Temperature Sensor



3240107

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Left
- OEM Connector: 10010344
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 Multilock Series, Sealed(BK)

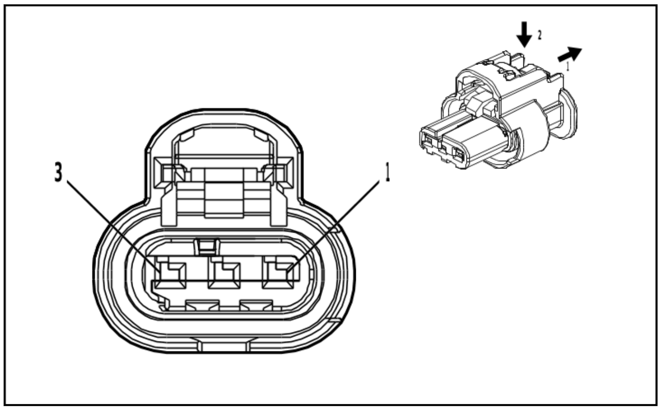
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B310 Fuel Pressure and Temperature Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / GN	(1) 548	(1) Engine Control Sensors Low Reference 1	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / WH	(2) 10786	(2) Fuel Rail Pressure Sensor SENT 1 Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BN / RD	(3) 480	(3) Engine Control Vehicle Sensors 5 Volt Reference 1	(3) I	(3) —

B321 Crankcase Pressure Sensor



4994602

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13514592
- Service Connector: 19371199
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

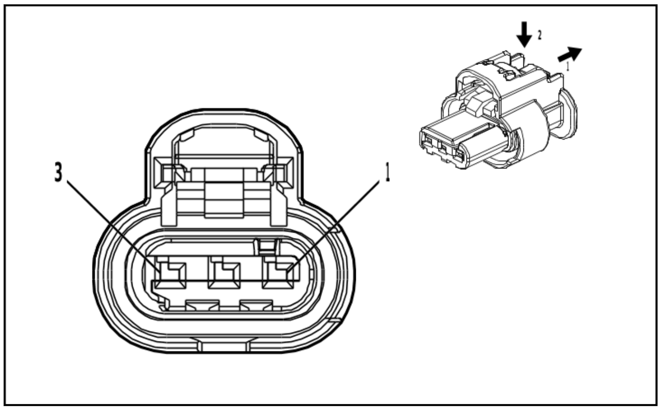
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B321 Crankcase Pressure Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE / GY	(1) 3926	(1) Crankcase Differential Pressure Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GN	(2) 580	(2) Engine Control Sensors Low Reference 2	(2) I	(2) —
(3) 3	(3) 0.5	(3) GY / RD	(3) 10667	(3) Engine Control Sensors 5 Volt Reference	(3) I	(3) —

B345P Exhaust Pressure Differential Sensor - Particulate Filter



4581126

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: 86792094
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

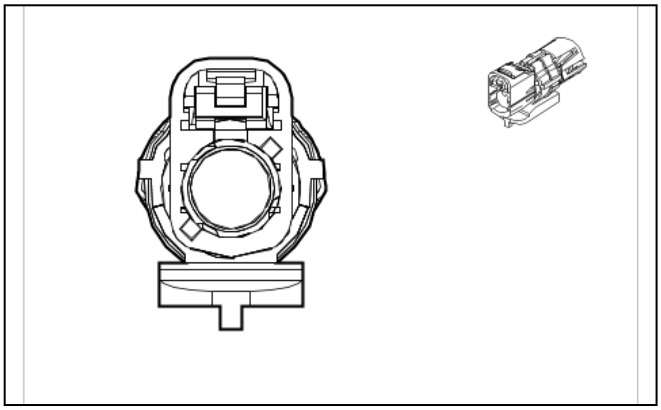
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B345P Exhaust Pressure Differential Sensor - Particulate Filter

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) WH / RD	(1) 480	(1) Engine Control Vehicle Sensors 5 Volt Reference 1	(1) I	(1) —
(2) 2	(2) 1	(2) WH / BN	(2) 2363	(2) Exhaust Pressure Sensor SENT 1 Signal	(2) I	(2) —
(3) 3	(3) 1	(3) BK / GY	(3) 626	(3) Engine Control Vehicle Sensors Low Reference 1	(3) I	(3) —

B352 Video Display Inside Rearview Mirror Camera (DRZ)



5633894

Connector Part Information
- Harness Type: Inside Rearview Mirror Wiring Harness
- OEM Connector: 35187049
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type, Sealed(BU)

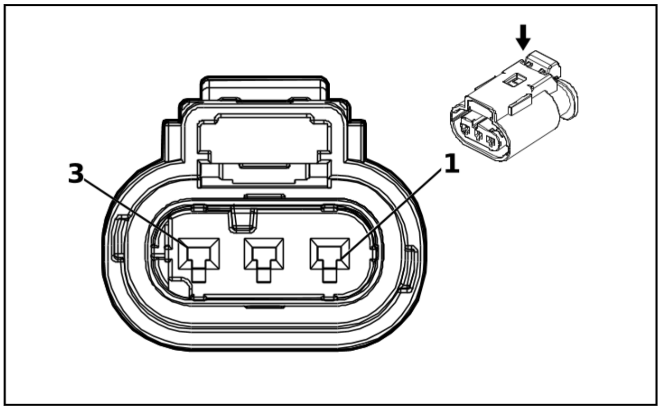
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

B352 Video Display Inside Rearview Mirror Camera (DRZ)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
BU	—	Coax Cable	2387	Full Display Mirror Rear Camera LVDS (Low Voltage Differential Signaling) Coaxial Signal	I	—

B359 Exhaust Gas Temperature Sensor Module



5192187

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13503572
- Service Connector: 84777453
- Description: 3-Way F 1.2 Multilock Series, Sealed(BK)

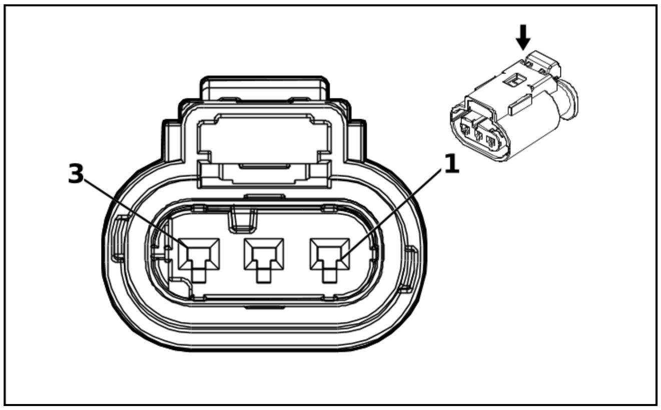
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B359 Exhaust Gas Temperature Sensor Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN	(1) 10289	(1) Exhaust Gas Temperature Sensor SENT 1 Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GN	(2) 580	(2) Engine Control Sensors Low Reference 2	(2) I	(2) —
(3) 3	(3) 0.5	(3) GY / RD	(3) 10667	(3) Engine Control Sensors 5 Volt Reference	(3) I	(3) —

B359B Exhaust Gas Temperature Sensor Module 2



5192187

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 10010343
- Service Connector: 84777453
- Description: 3-Way F 1.2 Multilock Series, Sealed(BK)

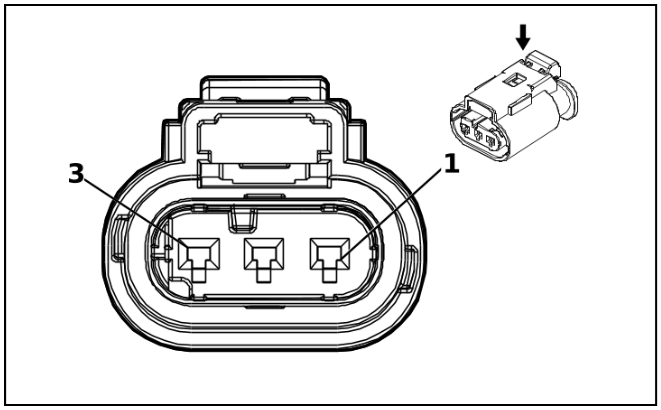
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B359B Exhaust Gas Temperature Sensor Module 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU	(1) 10290	(1) Exhaust Gas Temperature Sensor SENT 2 Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 626	(2) Engine Control Vehicle Sensors Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / RD	(3) 10595	(3) Engine Control Vehicle Sensors 5 Volt Reference 2	(3) I	(3) —

B359C Exhaust Gas Temperature Sensor Module 3



5192187

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 10010343
- Service Connector: 84777453
- Description: 3-Way F 1.2 Multilock Series, Sealed(BK)

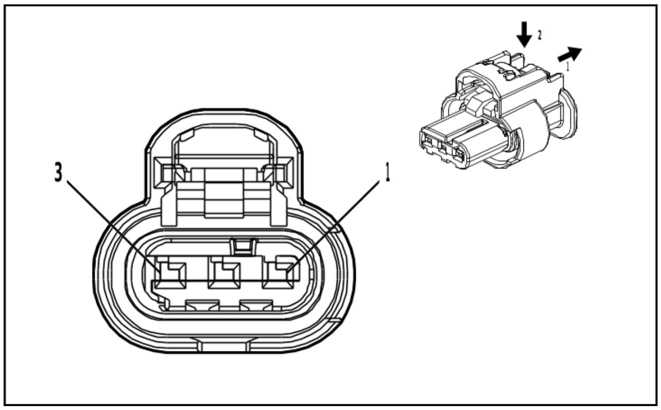
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

B359C Exhaust Gas Temperature Sensor Module 3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE	(1) 10291	(1) Exhaust Gas Temperature Sensor SENT 3 Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 626	(2) Engine Control Vehicle Sensors Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / RD	(3) 10595	(3) Engine Control Vehicle Sensors 5 Volt Reference 2	(3) I	(3) —

B394 Evaporative Emission Canister Purge System Pressure Sensor



4778903

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 1-2296695-2
- Service Connector: 86792095
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

B394 Evaporative Emission Canister Purge System Pressure Sensor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE / GY	(1) 11029	(1) Canister Vapor Pressure Sensor Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 626	(2) Engine Control Vehicle Sensors Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) WH / RD	(3) 480	(3) Engine Control Vehicle Sensors 5 Volt Reference 1	(3) I	(3) —

C1D Battery 2

—

Connector Part Information
- Harness Type: Auxiliary Battery Negative Cable
- OEM Connector: 84392524
- Service Connector: Service by Harness - See Part Catalog
- Description: Battery Ground

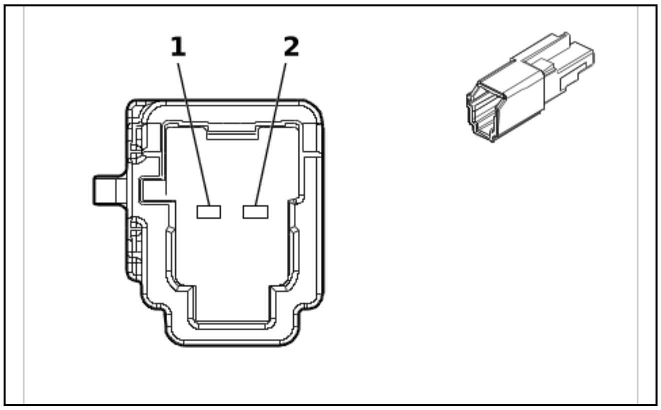
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

C1D Battery 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	35	BK	350	Ground	I	K4Z/ KHF

E3A Front Clearance Lamp - Roof Left Outer



6529124

Connector Part Information
- Harness Type: Roof Wiring Harness
- OEM Connector: 6099-0610
- Service Connector: 85725003
- Description: 2-Way M 1.2 MBS Series(BK)

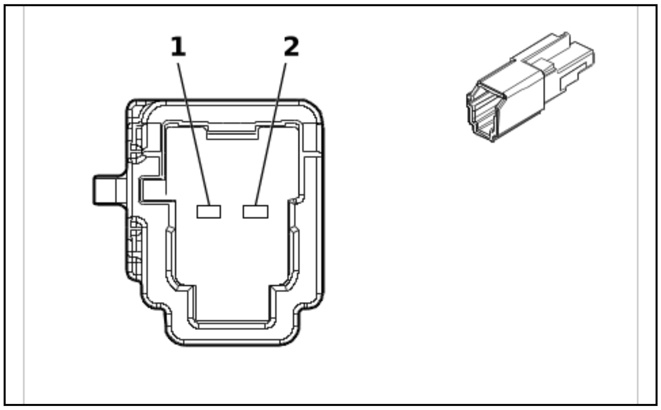
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

E3A Front Clearance Lamp - Roof Left Outer

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) Identification Lamp Control	(2) I	(2) —

E3E Front Clearance Lamp - Roof Right Outer



6529124

Connector Part Information
- Harness Type: Roof Wiring Harness
- OEM Connector: 6099-0610
- Service Connector: 85725003
- Description: 2-Way M 1.2 MBS Series(BK)

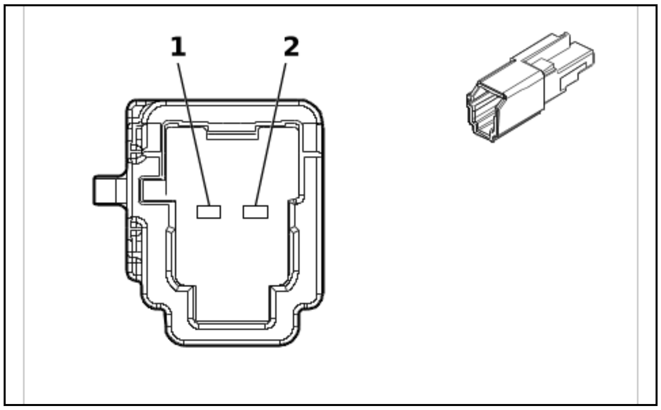
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

E3E Front Clearance Lamp - Roof Right Outer

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) Identification Lamp Control	(2) I	(2) —

E3FA Front Identification Lamp



6529124

Connector Part Information
- Harness Type: Roof Wiring Harness
- OEM Connector: 6099-0610
- Service Connector: 85725003
- Description: 2-Way M 1.2 MBS Series(BK)

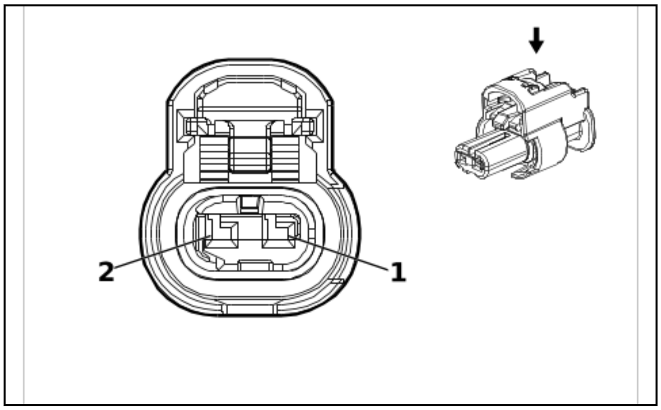
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

E3FA Front Identification Lamp

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) Identification Lamp Control	(2) I	(2) —

E3LF Rear Clearance Lamp - Fender Left Front



4335931

Connector Part Information

- Harness Type: Rear License Plate Lamp Wiring Harness Extension Harness - Left
- OEM Connector: 1-2296694-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

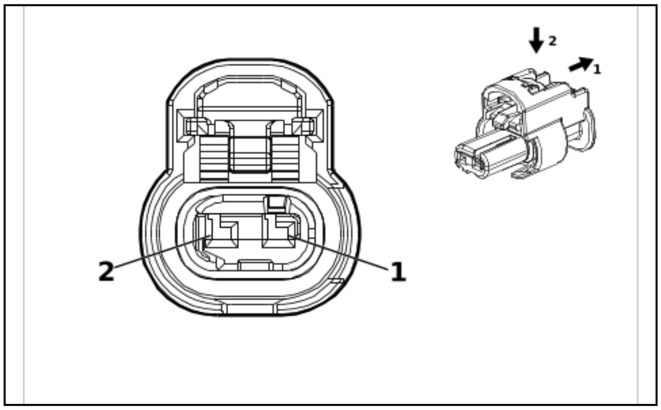
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

E3LF Rear Clearance Lamp - Fender Left Front

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1850	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) Identification Lamp Control	(2) I	(2) —

E3LR Rear Clearance Lamp - Fender Left Rear



4649903

Connector Part Information

- Harness Type: Rear License Plate Lamp Wiring Harness Extension Harness - Left
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

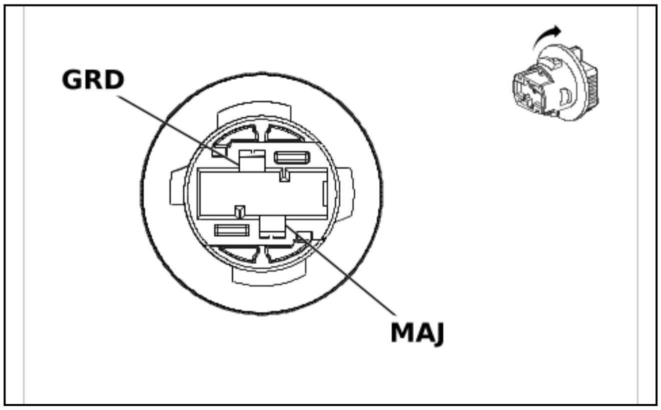
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

E3LR Rear Clearance Lamp - Fender Left Rear

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / GN	(1) 4246	(1) Identification Lamp Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

E3RA Rear Identification Lamp



6458333

Connector Part Information
- Harness Type: Rear Body Structure Stop Lamp
- OEM Connector: EEM1214
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F T20 Lamp Socket(BK)

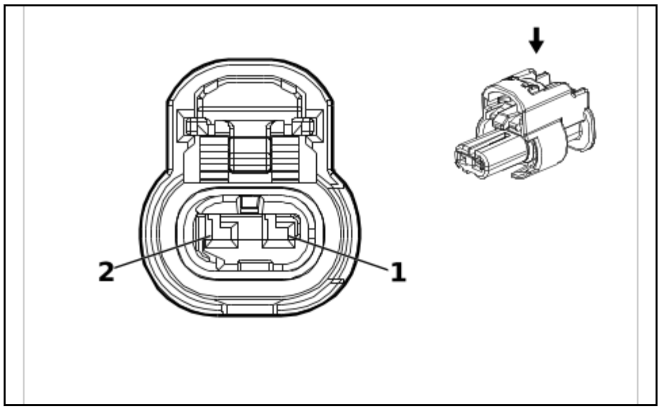
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E3RA Rear Identification Lamp

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
GND	—	BK	1850	Ground	I	—
GRD	—	—	—	Not Occupied	—	—
MAJ	—	BN / GN	4246	Identification Lamp Control	I	—

E3RF Rear Clearance Lamp - Fender Right Front



4335931

Connector Part Information
- Harness Type: Rear License Plate Lamp Wiring Harness Extension Harness - Right
- OEM Connector: 1-2296694-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

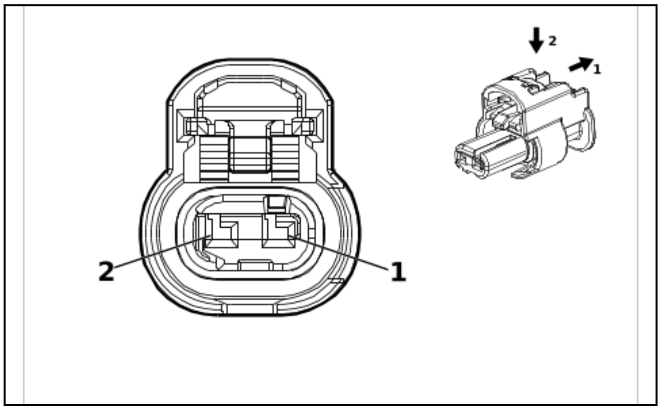
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

E3RF Rear Clearance Lamp - Fender Right Front

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1850	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) Identification Lamp Control	(2) I	(2) —

E3RR Rear Clearance Lamp - Fender Right Rear



4649903

Connector Part Information
- Harness Type: Rear License Plate Lamp Wiring Harness Extension Harness - Right
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

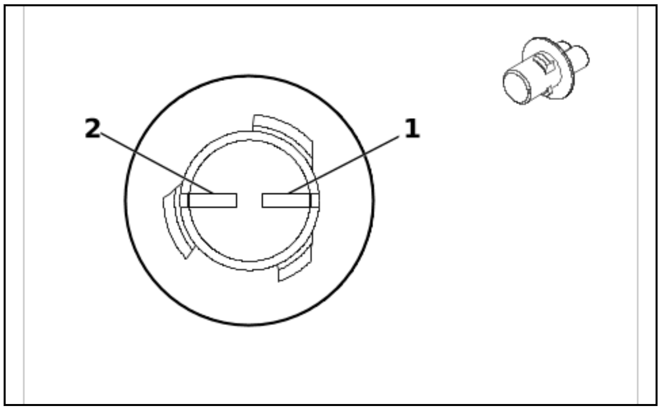
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

E3RR Rear Clearance Lamp - Fender Right Rear

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / GN	(1) 4246	(1) Identification Lamp Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

E5A Backup Bulb - Left



6157373

Connector Part Information

- Harness Type: Rear Body Structure Stop Lamp
- OEM Connector: EEM0323
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F Lamp Socket(BK)

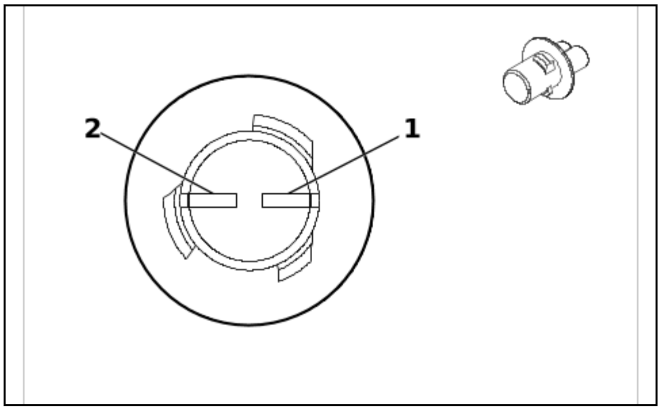
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E5A Backup Bulb - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) GN	(1) 24	(1) Backup Lamp Control	(1) I	(1) —
(2) 2	(2) —	(2) BK	(2) 1951	(2) Signal Ground	(2) I	(2) —

E5B Backup Bulb - Right



6157373

Connector Part Information
- Harness Type: Rear Body Structure Stop Lamp
- OEM Connector: EEM0323
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F Lamp Socket(BK)

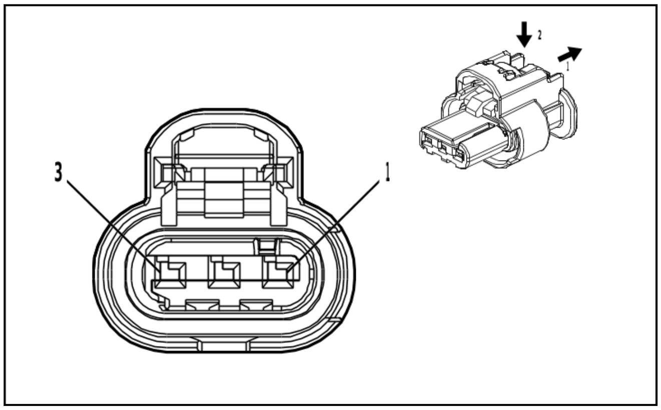
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E5B Backup Bulb - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) GN	(1) 24	(1) Backup Lamp Control	(1) I	(1) —
(2) 2	(2) —	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

E6A High Mount Stop and Cargo Lamp - Crew Cab and Double Cab



4581126

Connector Part Information
- Harness Type: Inside Rearview Mirror Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

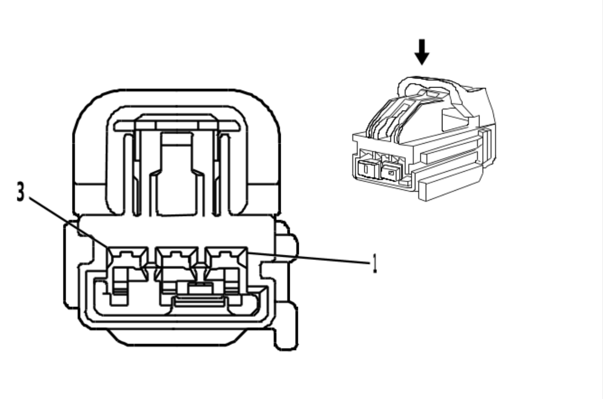
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

E6A High Mount Stop and Cargo Lamp - Crew Cab and Double Cab

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35 (1) 0.5	(1) WH / VT (1) WH / VT	(1) 1430 (1) 1430	(1) Exterior Courtesy Lamp Control (1) Exterior Courtesy Lamp Control	(1) I (1) I	(1) — (1) —
(2) 2	(2) 0.35 (2) 0.5	(2) VT / WH (2) BN / YE	(2) 820 (2) 820	(2) Center High Mounted Stop Lamp Supply Voltage (2) Center High Mounted Stop Lamp Supply Voltage	(2) I (2) I	(2) — (2) —
(3) 3	(3) 0.35 (3) 0.5	(3) BK (3) BK	(3) 1050 (3) 1050	(3) Ground (3) Ground	(3) I (3) I	(3) — (3) —

E6A High Mount Stop and Cargo Lamp - Regular Cab



1787799

Connector Part Information

- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 7283-3440-40
- Service Connector: 86825460
- Description: 3-Way F 1.5 Kaizen Series(L-GY)

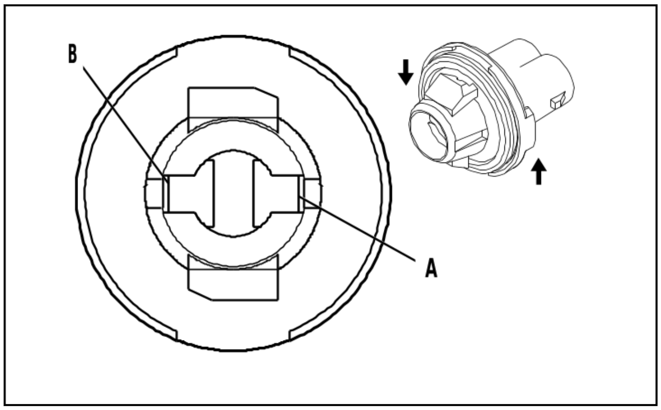
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

E6A High Mount Stop and Cargo Lamp - Regular Cab

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / VT	(1) 1430	(1) Exterior Courtesy Lamp Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / BK	(2) 1053	(2) Center High Mounted Stop Lamp Control 3	(2) I	(2) —
(3) 3	(3) 1	(3) BK	(3) 1050	(3) Ground	(3) I	(3) —

E7 Rear License Plate Lamp (ZW9)



744036

Connector Part Information
- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 15324946
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F Lamp Socket Wedge Base, Type W-2(D-GY)

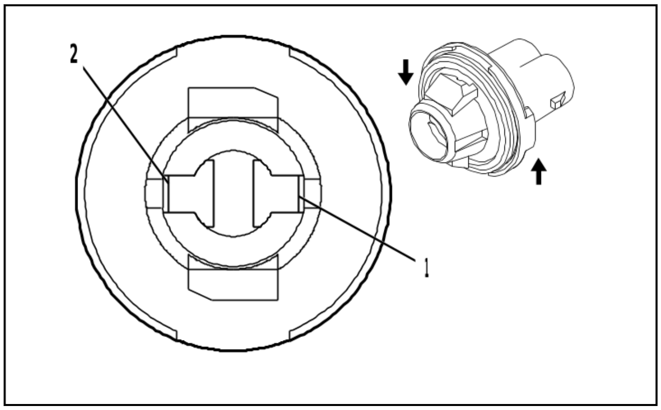
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E7 Rear License Plate Lamp (ZW9)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) GN / YE	(1) 6846	(1) Rear License Plate Lamp Control	(1) I	(1) —
(2) 2	(2) —	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —
A - B	—	—	—	Not Occupied	—	—

E7L Rear License Plate Lamp - Left



5153536

Connector Part Information
- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 15324946
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F Lamp Socket Wedge Base, Type W-2(D-GY)

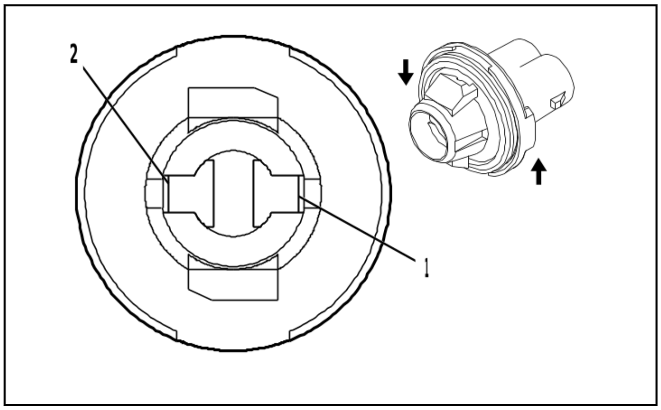
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E7L Rear License Plate Lamp - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / YE	(1) 6846	(1) Rear License Plate Lamp Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

E7R Rear License Plate Lamp - Right



5153536

Connector Part Information

- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 15324946
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F Lamp Socket Wedge Base, Type W-2(D-GY)

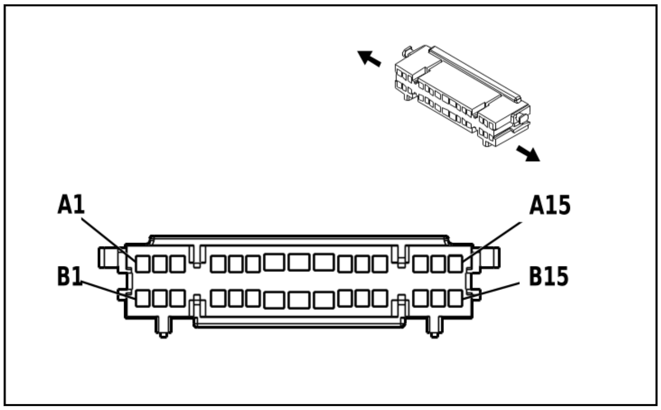
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E7R Rear License Plate Lamp - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / YE	(1) 6846	(1) Rear License Plate Lamp Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

E8ZL Assist Step Lamp - Left



655763

Connector Part Information

- Harness Type: Left Running Board Harness
- OEM Connector: 13583926
- Service Connector: Service by Harness - See Part Catalog
- Description: 30-Way F 150, 280 GT FBT Series(BK)

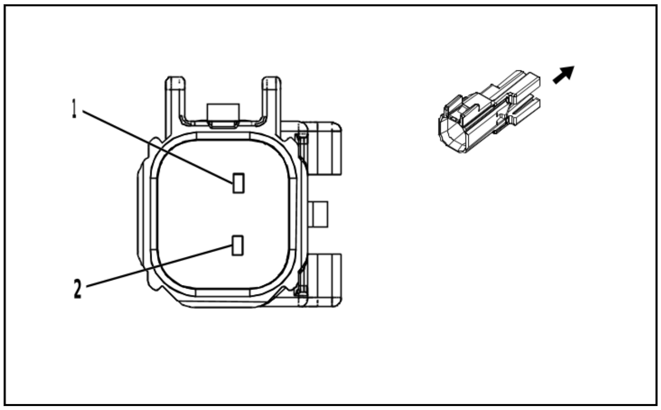
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E8ZL Assist Step Lamp - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A1	—	BN	4748	Left Running Board Step Courtesy Lamp Control	I	—
A2	—	BK	1850	Ground	I	—
A3 - B15	—	—	—	Not Occupied	—	—

E8ZR Assist Step Lamp - Right



3271068

Connector Part Information

- Harness Type: Right Running Board Harness
- OEM Connector: 13503926
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.5 Series, Sealed(BK)

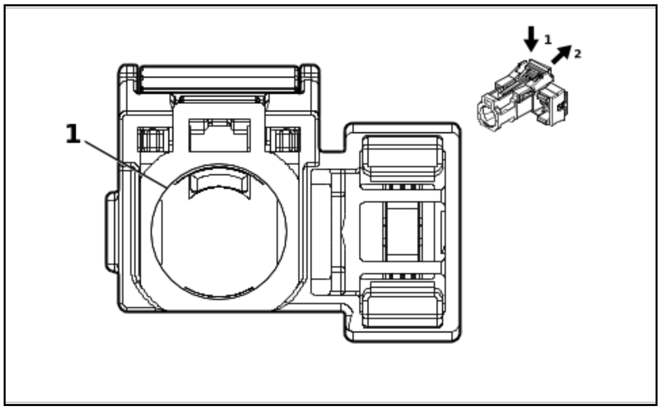
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E8ZR Assist Step Lamp - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / VT	(1) 4749	(1) Right Running Board Step Courtesy Lamp Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

E12A Glow Plug 1



6166047

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13551815
- Service Connector: Service by Cable Assembly - See Part Catalog
- Description: 1-Way F RK4 Receptacle(BK)

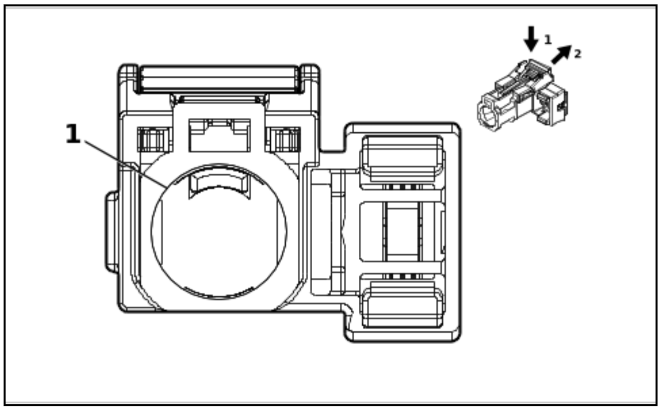
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E12A Glow Plug 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY / BU	(1) 1581	(1) Glow Plug 1 Control	(1) I	(1) —

E12B Glow Plug 2



6166047

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13551815
- Service Connector: Service by Cable Assembly - See Part Catalog
- Description: 1-Way F RK4 Receptacle(BK)

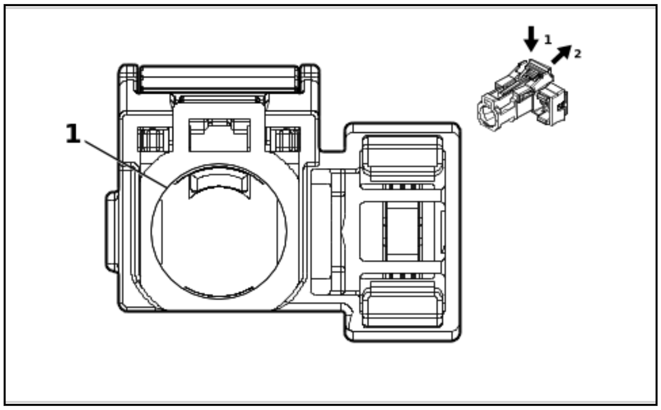
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E12B Glow Plug 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY / BN	(1) 1582	(1) Glow Plug 2 Control	(1) I	(1) —

E12C Glow Plug 3



6166047

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13551815
- Service Connector: Service by Cable Assembly - See Part Catalog
- Description: 1-Way F RK4 Receptacle(BK)

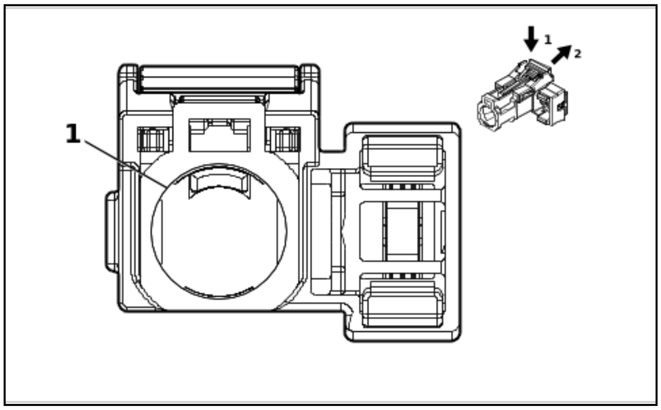
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E12C Glow Plug 3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY / GN	(1) 1583	(1) Glow Plug 3 Control	(1) I	(1) —

E12D Glow Plug 4



6166047

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13551815
- Service Connector: Service by Cable Assembly - See Part Catalog
- Description: 1-Way F RK4 Receptacle(BK)

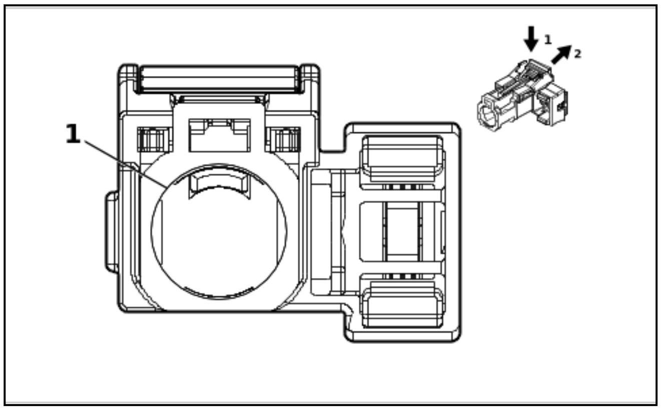
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E12D Glow Plug 4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY / YE	(1) 1584	(1) Glow Plug 4 Control	(1) I	(1) —

E12E Glow Plug 5



6166047

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13551815
- Service Connector: Service by Cable Assembly - See Part Catalog
- Description: 1-Way F RK4 Receptacle(BK)

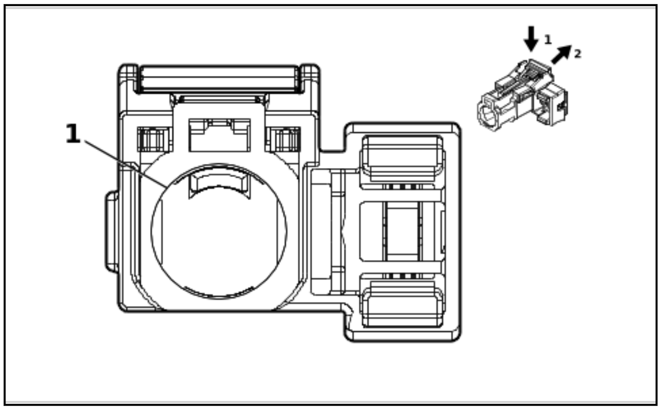
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E12E Glow Plug 5

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY / WH	(1) 1585	(1) Glow Plug 5 Control	(1) I	(1) —

E12F Glow Plug 6



6166047

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13551815
- Service Connector: Service by Cable Assembly - See Part Catalog
- Description: 1-Way F RK4 Receptacle(BK)

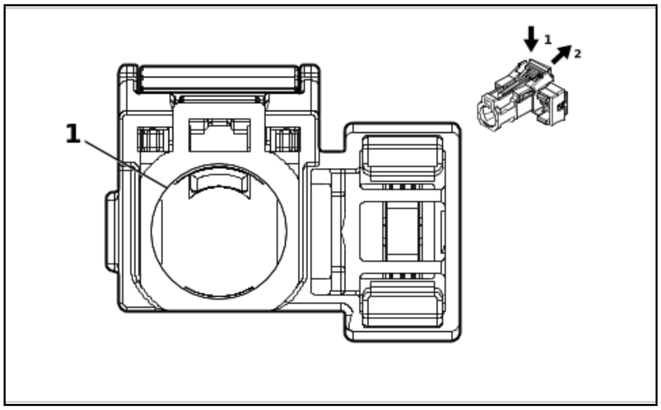
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E12F Glow Plug 6

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY / VT	(1) 1586	(1) Glow Plug 6 Control	(1) I	(1) —

E12G Glow Plug 7



6166047

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13551815
- Service Connector: Service by Cable Assembly - See Part Catalog
- Description: 1-Way F RK4 Receptacle(BK)

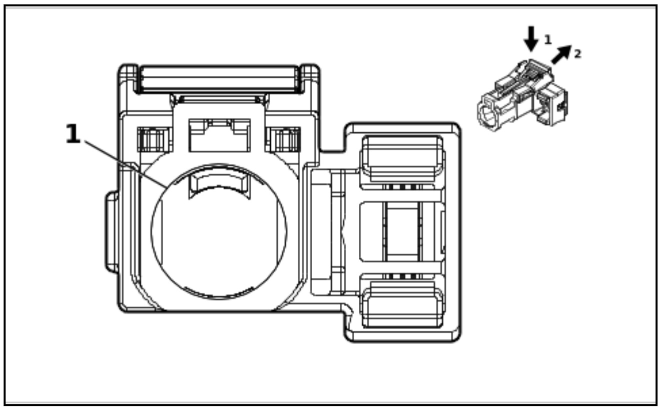
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E12G Glow Plug 7

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) WH / BK	(1) 1587	(1) Glow Plug 7 Control	(1) I	(1) —

E12H Glow Plug 8



6166047

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13551815
- Service Connector: Service by Cable Assembly - See Part Catalog
- Description: 1-Way F RK4 Receptacle(BK)

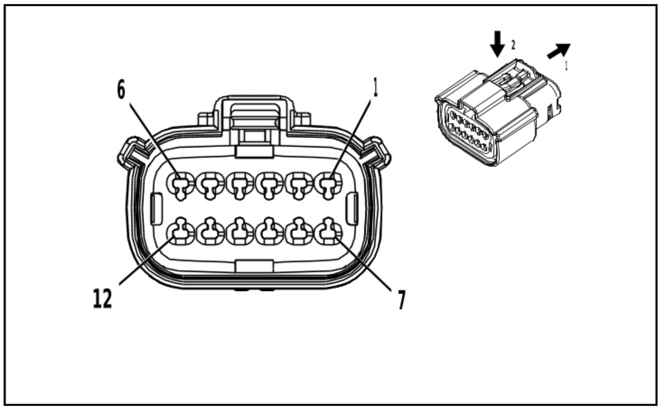
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E12H Glow Plug 8

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) WH / BU	(1) 1588	(1) Glow Plug 8 Control	(1) I	(1) —

E13LA Front Headlamp - Left



2871860

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 33472-1266
- Service Connector: 19352907
- Description: 12-Way F 1.5 MX Series, Sealed(BK)

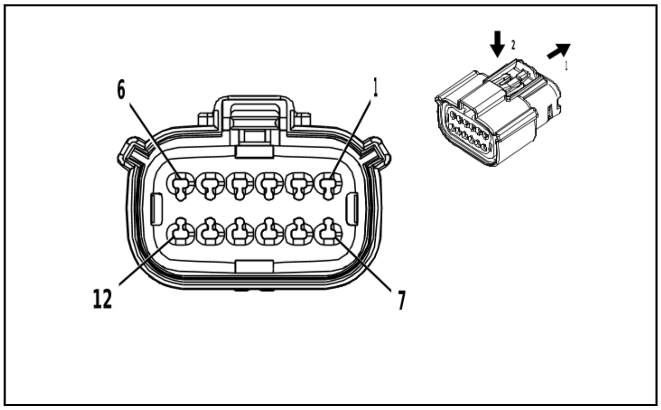
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85528055	J-35616-2A (GY)	J-38125-217

E13LA Front Headlamp - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) BK	(1) 150	(1) Ground	(1) I	(1) —
(2) 2	(2) 1.5	(2) RD / WH	(2) 640	(2) Battery Positive Voltage	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE	(3) 712	(3) Left Headlamp Low Beam Control	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 711	(4) Left Headlamp High Beam Control	(4) I	(4) —
(5) 5	(5) 0.35	(5) GY / BU	(5) 7538	(5) Left Front DRL Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) WH / YE	(6) 1254	(6) Left Front Park Lamp Control	(6) I	(6) —
(7) 7	(7) 0.5	(7) BU / WH	(7) 1314	(7) Left Front Turn Signal Lamp Control	(7) I	(7) —
(8) 8	(8) 0.35	(8) VT / BK	(8) 6568	(8) Front Turn Signal Lamp Feedback Signal	(8) I	(8) —
(9) 9	(9) 0.5	(9) YE / GN	(9) 2024	(9) Animation Lighting Control	(9) I	(9) —
(10) 10	(10) 0.5	(10) GN / VT	(10) 1315	(10) Right Front Turn Signal Lamp Control	(10) I	(10) —
11 - 12	—	—	—	Not Occupied	—	—

E13RA Front Headlamp - Right



2871860

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 33472-1266
- Service Connector: 19352907
- Description: 12-Way F 1.5 MX Series, Sealed(BK)

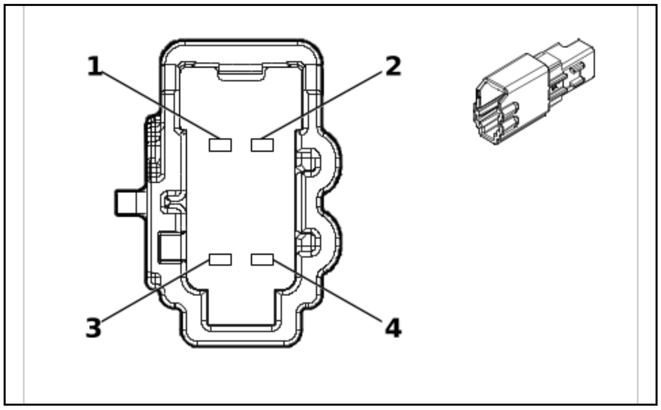
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85528055	J-35616-2A (GY)	J-38125-217

E13RA Front Headlamp - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) BK	(1) 650	(1) Ground	(1) I	(1) —
(2) 2	(2) 1.5	(2) RD / YE	(2) 740	(2) Battery Positive Voltage	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE	(3) 312	(3) Right Headlamp Low Beam Control	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 311	(4) Right Headlamp High Beam Control	(4) I	(4) —
(5) 5	(5) 0.35	(5) BU / BN	(5) 7539	(5) Right Front DRL Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / GN	(6) 1253	(6) Right Front Park Lamp Control	(6) I	(6) —
(7) 7	(7) 0.5	(7) GN / VT	(7) 1315	(7) Right Front Turn Signal Lamp Control	(7) I	(7) —
(8) 8	(8) 0.35	(8) WH / YE	(8) 7545	(8) Right Front Turn Signal Lamp Feedback Signal	(8) I	(8) —
(9) 9	(9) 0.5	(9) YE / GN	(9) 2024	(9) Animation Lighting Control	(9) I	(9) —
(10) 10	(10) 0.5	(10) BU / WH	(10) 1314	(10) Left Front Turn Signal Lamp Control	(10) I	(10) —
11 - 12	—	—	—	Not Occupied	—	—

E14A Front Seat Back Heater - Driver (KA1)



5423974

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 6098-9049
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(GY)

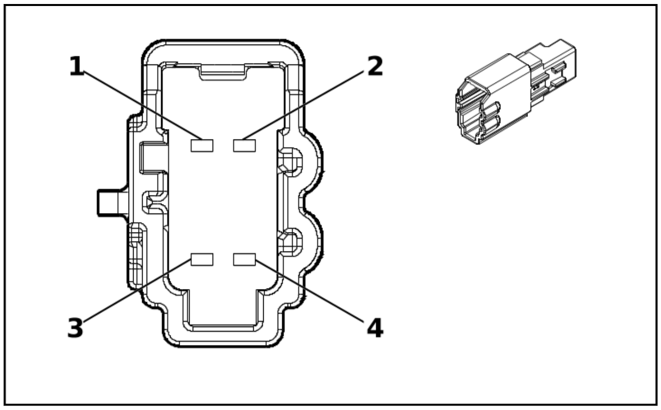
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

E14A Front Seat Back Heater - Driver (KA1)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN	(1) 2432	(1) Driver Seat Back Heating Element Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU	(2) 2425	(2) Driver Seat Back Heating Temperature Sensor Signal	(2) II	(2) —
(3) 3	(3) 0.5	(3) BK / YE	(3) 2080	(3) Driver Heated Seat Thermistor Low Reference	(3) II	(3) —
(4) 4	(4) 0.75	(4) BN / BK	(4) 2078	(4) Driver Seat Heating Element Low Reference	(4) I	(4) —

E14B Front Seat Cushion Heater - Driver (KA1)



5360963

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 6098-9046
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(BK)

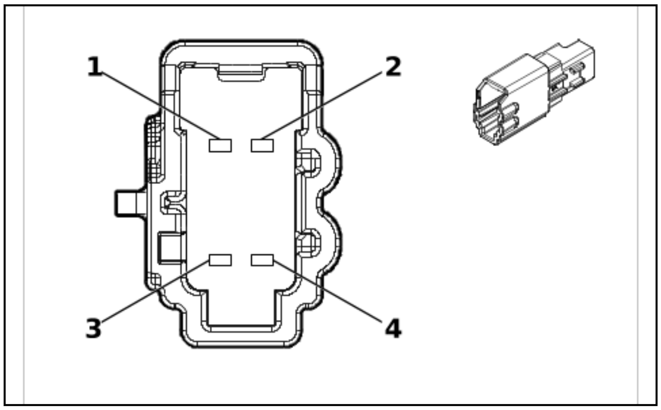
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

E14B Front Seat Cushion Heater - Driver (KA1)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / VT	(1) 2077	(1) Driver Seat Heating Element Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / GY	(2) 2079	(2) Driver Seat Heating Temperature Sensor Signal	(2) II	(2) —
(3) 3	(3) 0.5	(3) BK / YE	(3) 2080	(3) Driver Heated Seat Thermistor Low Reference	(3) II	(3) —
(4) 4	(4) 0.75	(4) BN / BK	(4) 2078	(4) Driver Seat Heating Element Low Reference	(4) I	(4) —

E14C Front Seat Back Heater - Passenger (KA1)



5423974

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 6098-9049
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(GY)

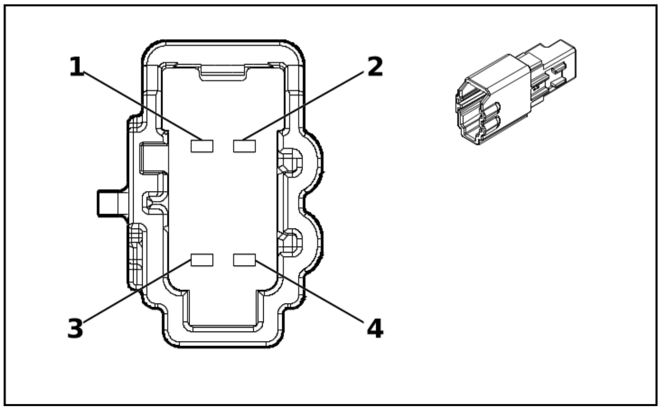
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

E14C Front Seat Back Heater - Passenger (KA1)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) WH / BN	(1) 2481	(1) Passenger Seat Back Heating Element Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / BU	(2) 2436	(2) Passenger Seat Back Heating Temperature Sensor Signal	(2) II	(2) —
(3) 3	(3) 0.5	(3) BK / GN	(3) 2482	(3) Passenger Heated Back Thermistor Low Reference	(3) II	(3) —
(4) 4	(4) 0.75	(4) GY / BK	(4) 2480	(4) Passenger Seat Heating Element Low Reference	(4) I	(4) —

E14D Front Seat Cushion Heater - Passenger (KA1)



5360963

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 6098-9046
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(BK)

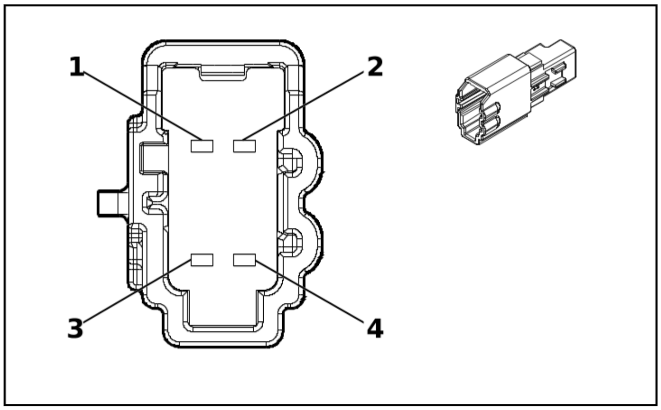
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

E14D Front Seat Cushion Heater - Passenger (KA1)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / BU	(1) 2479	(1) Passenger Seat Heating Element Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / GY	(2) 2434	(2) Passenger Seat Heating Temperature Sensor Signal	(2) II	(2) —
(3) 3	(3) 0.5	(3) BK / GY	(3) 2435	(3) Passenger Heated Seat Thermistor Low Reference	(3) II	(3) —
(4) 4	(4) 0.75	(4) GY / BK	(4) 2480	(4) Passenger Seat Heating Element Low Reference	(4) I	(4) —

E14F Rear Seat Cushion Heater - Left Rear (KA6)



5360963

Connector Part Information

- Harness Type: Rear Seat Heater Control Wiring Harness
- OEM Connector: 6098-9046
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(BK)

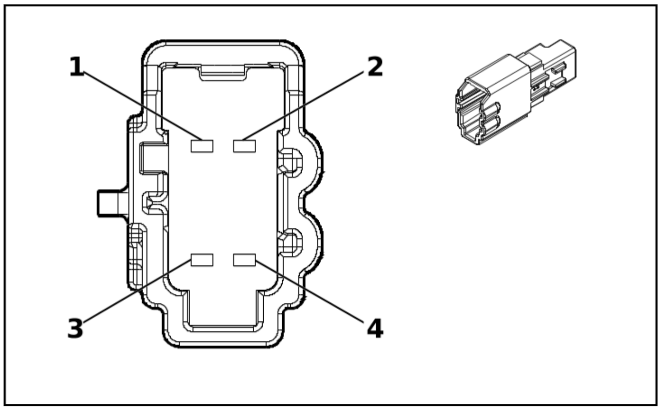
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

E14F Rear Seat Cushion Heater - Left Rear (KA6)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GY	(1) 2294	(1) Left Rear Seat Cushion Heating Element Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) WH / BU	(2) 7047	(2) Left Rear Seat Cushion Temperature Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.75	(3) BU / WH	(3) 7048	(3) Left Rear Cushion Thermistor Feedback Signal	(3) I	(3) —
(4) 4	(4) 0.75	(4) BN / BK	(4) 2295	(4) Left Rear Seat Cushion Heating Element Low Reference	(4) I	(4) —

E14H Rear Seat Cushion Heater - Right Rear (KA6)



5360963

Connector Part Information

- Harness Type: Rear Seat Heater Control Wiring Harness
- OEM Connector: 6098-9046
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(BK)

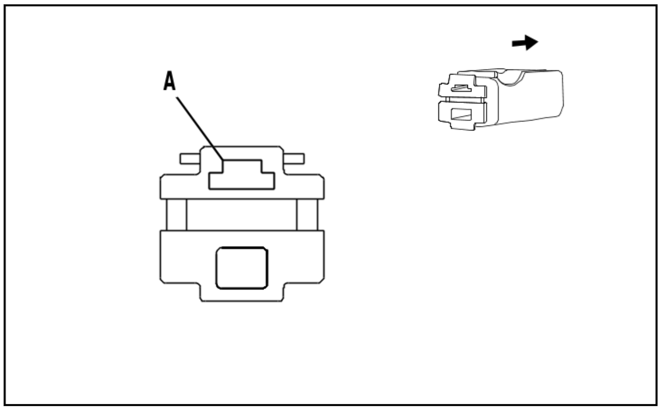
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

E14H Rear Seat Cushion Heater - Right Rear (KA6)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN / BN	(1) 2296	(1) Right Rear Seat Cushion Heating Element Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) YE / WH	(2) 7053	(2) Right Rear Seat Cushion Temperature Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.75	(3) WH / BK	(3) 7054	(3) Right Rear Cushion Thermistor Feedback Signal	(3) I	(3) —
(4) 4	(4) 0.75	(4) GN / BK	(4) 2297	(4) Right Rear Seat Cushion Heating Element Low Reference	(4) I	(4) —

E18 Rear Window Defogger Grid X1



4248834

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 7123-5014-30
- Service Connector: 19367647
- Description: 1-Way F 250 Series(BK)

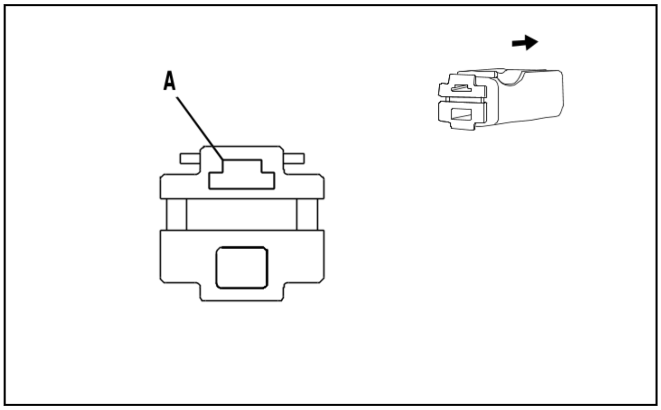
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required

E18 Rear Window Defogger Grid X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	2.5	BN / VT	293	Rear Defogger Grid Control	I	—

E18 Rear Window Defogger Grid X2



4248834

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 7123-5014-30
- Service Connector: 19367647
- Description: 1-Way F 250 Series(BK)

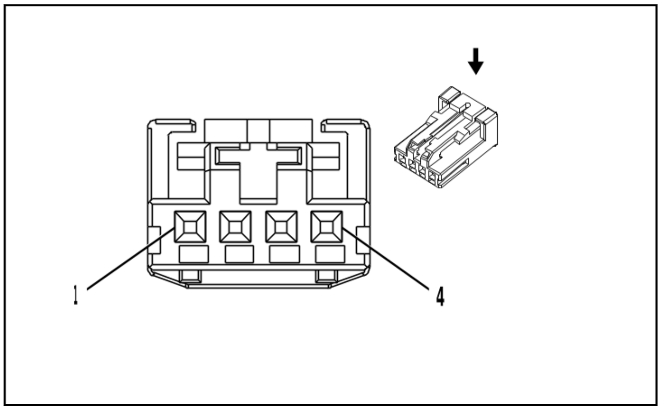
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required

E18 Rear Window Defogger Grid X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	2.5	BK	1450	Ground	I	—

E28 Front Floor Console Compartment Lamp



2717162

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 1-936119-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

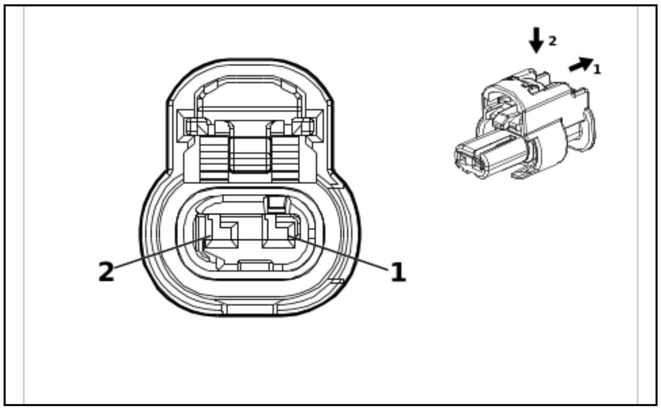
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

E28 Front Floor Console Compartment Lamp

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK	(1) 1350	(1) Ground	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) GN / VT	(3) 4786	(3) Dome/Reading Lamp Enable Signal	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

E29LF Front Fog Lamp - Left (T3U)



4649903

Connector Part Information
- Harness Type: Front Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

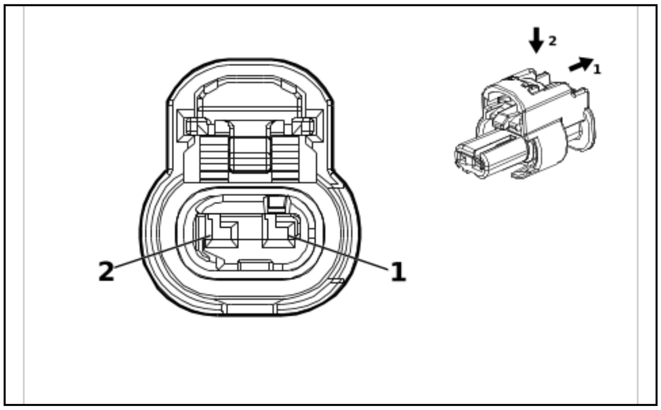
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

E29LF Front Fog Lamp - Left (T3U)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 650	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / GY	(2) 5061	(2) Left Front Fog Lamp Control	(2) I	(2) —

E29RF Front Fog Lamp - Right (T3U)



4649903

Connector Part Information
- Harness Type: Front Object Alarm Sensor Wiring Harness
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

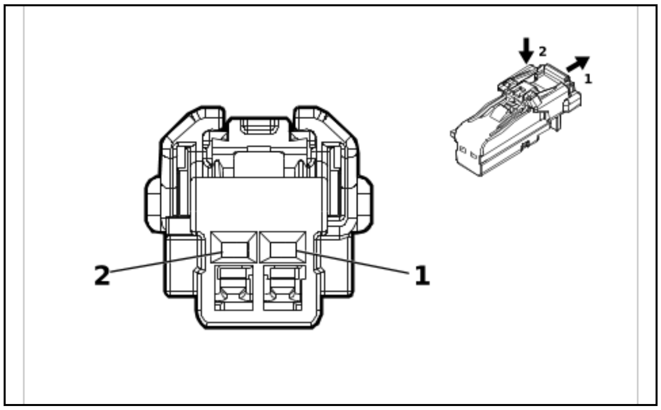
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

E29RF Front Fog Lamp - Right (T3U)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 650	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 5062	(2) Right Front Fog Lamp Control	(2) I	(2) —

E31L Sunshade Mirror Lamp - Left



5377746

Connector Part Information

- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 6098-8990
- Service Connector: 84867147
- Description: 2-Way F 1.2 MCON Series(BN)

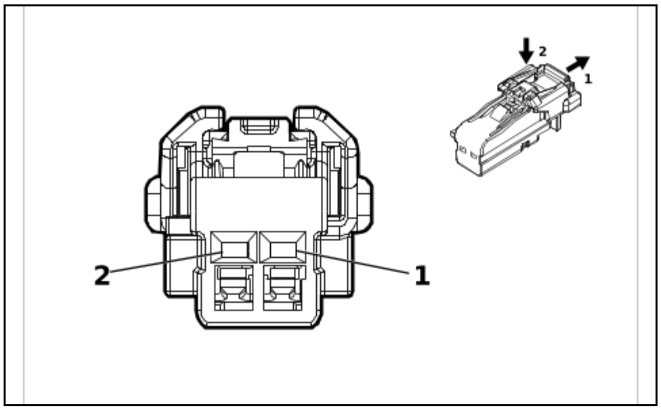
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required

E31L Sunshade Mirror Lamp - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BU / GN	(1) 4785	(1) Interior Lamp Overhead Enable Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1050	(2) Ground	(2) II	(2) —

E31R Sunshade Mirror Lamp - Right



5377746

Connector Part Information
- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 6098-8990
- Service Connector: 84867147
- Description: 2-Way F 1.2 MCON Series(BN)

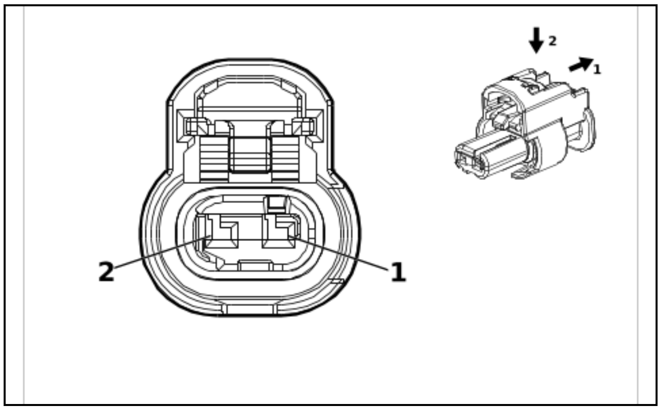
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required

E31R Sunshade Mirror Lamp - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GY / WH	(1) 2369	(1) Interior Lamp Overhead 2 Enable Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1050	(2) Ground	(2) II	(2) —

E33L Cargo Lamp - Left



4649903

Connector Part Information
- Harness Type: Rear Body Structure Stop Lamp
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

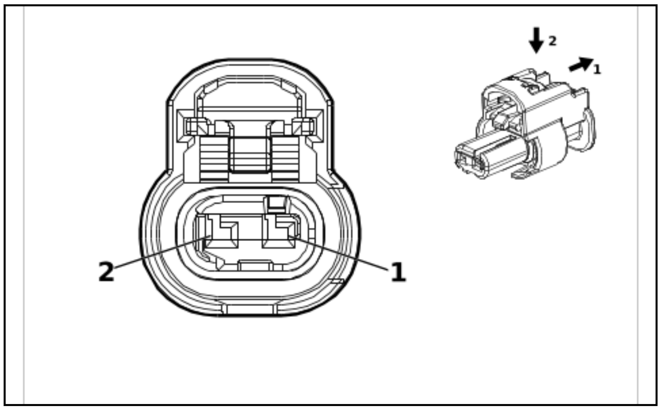
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E33L Cargo Lamp - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) BU	(1) 7762	(1) Cargo Lamp Control	(1) I	(1) —
(2) 2	(2) —	(2) BK	(2) 1951	(2) Signal Ground	(2) I	(2) —

E33R Cargo Lamp - Right



4649903

Connector Part Information
- Harness Type: Rear Body Structure Stop Lamp
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

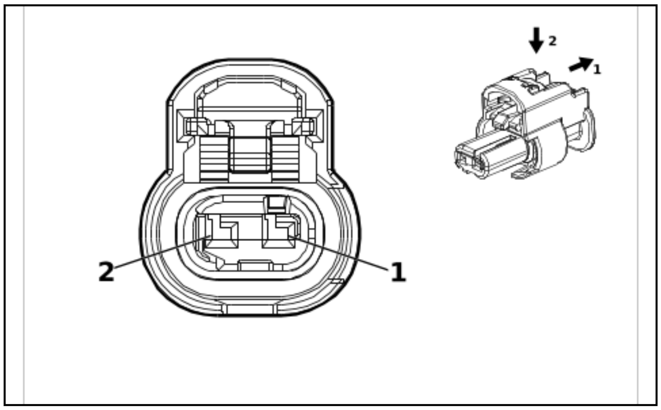
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E33R Cargo Lamp - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) BU	(1) 7762	(1) Cargo Lamp Control	(1) I	(1) —
(2) 2	(2) —	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

E33TH Rear Closure Auxiliary Signal Lamp



4649903

Connector Part Information
- Harness Type: Endgate Wiring Harness
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

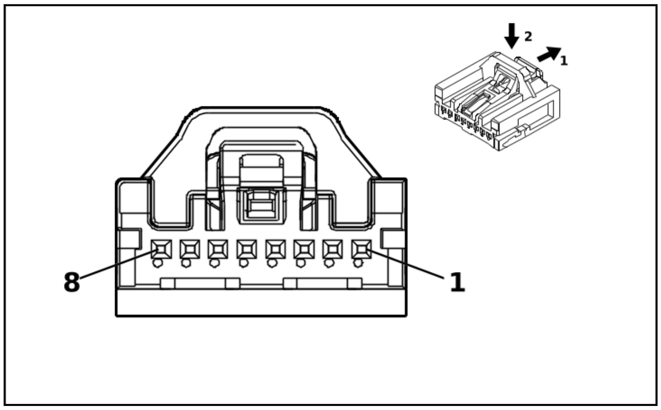
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

E33TH Rear Closure Auxiliary Signal Lamp

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / VT	(1) 1430	(1) Exterior Courtesy Lamp Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

E37SMC Rear Seat Position Center Reading and Courtesy Lamp



5200269

Connector Part Information
- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 35068228
- Service Connector: 84769201
- Description: 8-Way F Mini 50 Series(BK)

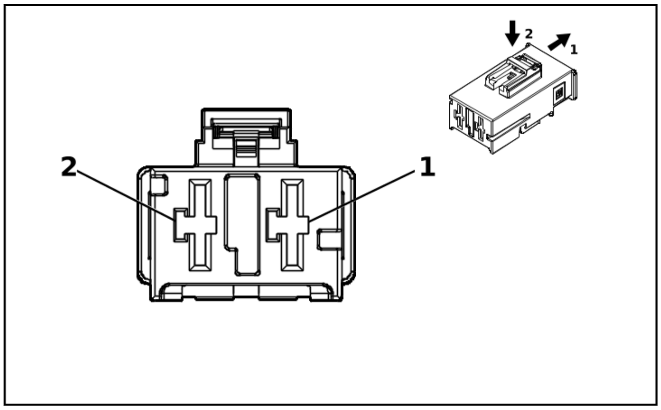
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required

E37SMC Rear Seat Position Center Reading and Courtesy Lamp

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN / YE	(1) 2903	(1) Row 2 Dome Reading Lamp Interior Lamp Control	(1) I	(1) —
(2) 2	(2) 0.35	(2) BN / BU	(2) 2905	(2) Row 2 Dome Reading Lamp 2 Interior Lamp Control	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK	(3) 1050	(3) Ground	(3) I	(3) —
(4) 4	(4) 0.35	(4) WH / BN	(4) 2904	(4) Row 2 Dome Reading Lamp Switch Signal	(4) I	(4) —
(5) 5	(5) 0.35	(5) VT / GY	(5) 2906	(5) Row 2 Dome Reading Lamp 2 Switch Signal	(5) I	(5) —
6 - 8	—	—	—	Not Occupied	—	—

E40 Air Heater X1 (C32)



5187955

Connector Part Information
- Harness Type: Auxiliary Heater Wiring Harness
- OEM Connector: 13525311
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 9.5 MCON-LL Series(BK)

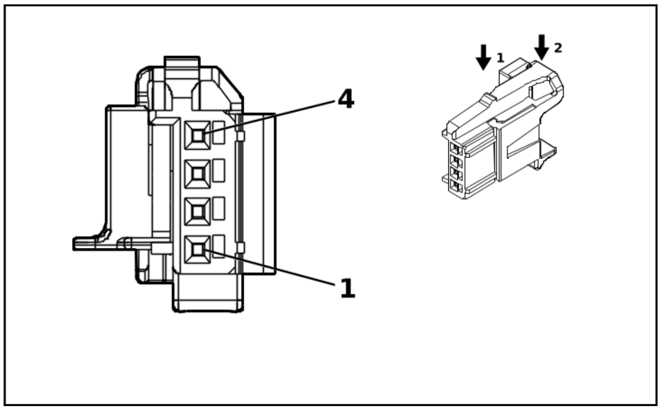
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E40 Air Heater X1 (C32)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) —	(2) RD / GY	(2) 642	(2) Battery Positive Voltage	(2) I	(2) —

E40 Air Heater X2 (C32)



5191926

Connector Part Information

- Harness Type: Heater Wiring Harness
- OEM Connector: 2294399-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

E40 Air Heater X2 (C32)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.35	(2) VT / BK	(2) 339	(2) Run/Crank Ignition 1 Voltage	(2) I	(2) —
(3) 3	(3) 0.35	(3) BU	(3) 2852	(3) Body Control Module LIN Bus 6	(3) I	(3) —
(4) 4	(4) 0.35	(4) BK	(4) 1050	(4) Ground	(4) I	(4) —

E40 Air Heater X3 (C32)

—

Connector Part Information

- Harness Type: Auxiliary Heater Wiring Harness
- OEM Connector: 20000001
- Service Connector: Service by Harness - See Part Catalog
- Description: 1-Way

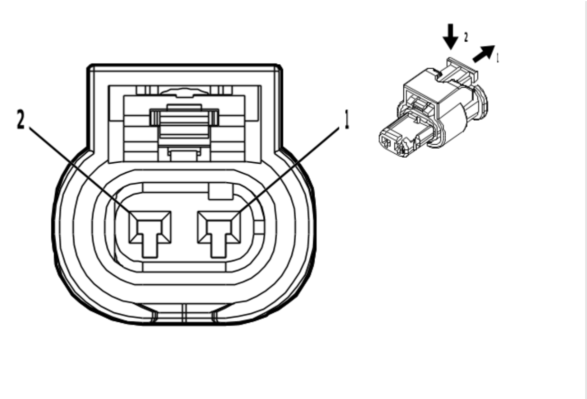
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

E40 Air Heater X3 (C32)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) BK	(1) 750	(1) Ground	(1) I	(1) —

E52 Reductant Heater 2 - Injector Supply Pipe (L5P)



2698576

Connector Part Information

- Harness Type: Emission Reduction Fluid Tank Reservoir Wire Harness
- OEM Connector: 1-1823608-5
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

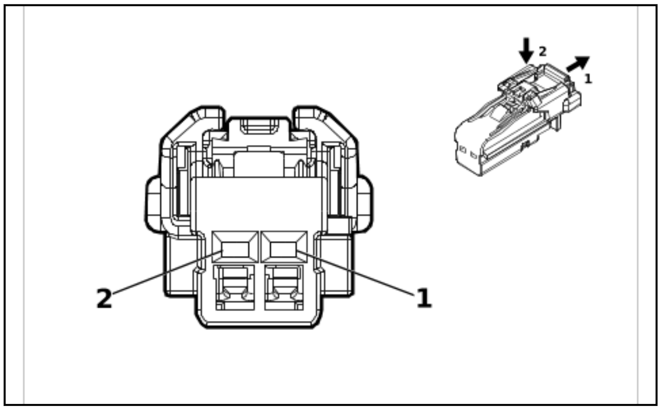
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

E52 Reductant Heater 2 - Injector Supply Pipe (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) WH	(1) 3199	(1) Diesel Exhaust Fluid Pressure Line Heater Control	(1) I	(1) —
(2) 2	(2) 1	(2) BN	(2) 4319	(2) Diesel Exhaust Fluid Line Heater Low Control	(2) I	(2) —

E63D Front Side Door Inside Handle Illumination Lamp - Left



4115691

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Left
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

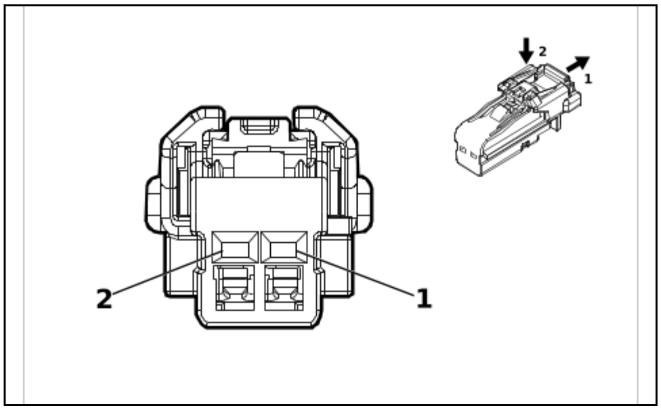
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

E63D Front Side Door Inside Handle Illumination Lamp - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / VT	(1) 2767	(1) LED Ambient Lighting Control Left Front Door	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1550	(2) Ground	(2) I	(2) —

E63P Front Side Door Inside Handle Illumination Lamp - Right



4115691

Connector Part Information
- Harness Type: Front Side Door Door Lock Door Wiring Harness - Right
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

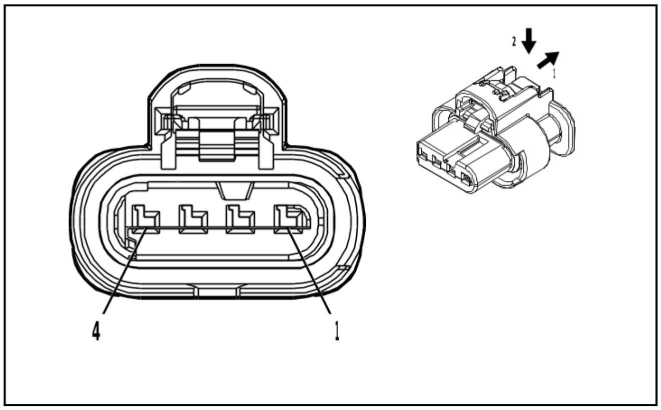
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

E63P Front Side Door Inside Handle Illumination Lamp - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / BN	(1) 2768	(1) LED Ambient Lighting Control Right Front Door	(1) I	(1) —
(2) 2	(2) 0.75	(2) BK	(2) 1350	(2) Ground	(2) I	(2) —

F101 Instrument Panel Airbag X1



4900699

Connector Part Information
- Harness Type: Instrument Panel Airbag Wiring Harness
- OEM Connector: 2296700-3
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 1.2 MCON-CB Series, Sealed(YE)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

F101 Instrument Panel Airbag X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) YE / OG	(1) 3025	(1) Passenger Instrument Panel Air Bag Stage 1 High Control	(1) I	(1) —
(2) 2	(2) —	(2) OG / WH	(2) 3024	(2) Passenger Instrument Panel Air Bag Stage 1 Low Control	(2) I	(2) —
3 - 4	—	—	—	Not Occupied	—	—

F101 Instrument Panel Airbag X2

—

Connector Part Information
- Harness Type: Instrument Panel Airbag Wiring Harness
- OEM Connector: 13530532
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way

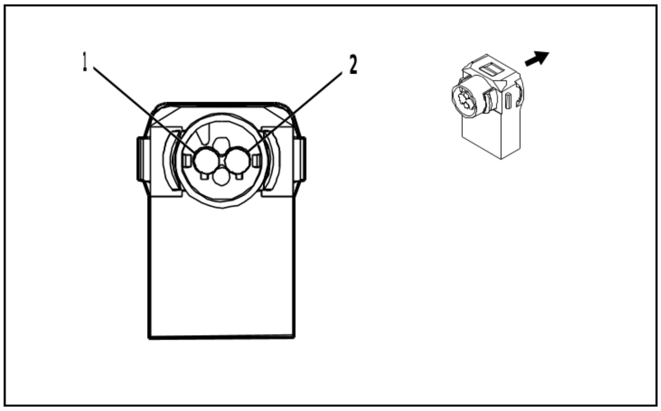
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

F101 Instrument Panel Airbag X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) GY / OG	(1) 3027	(1) Passenger Instrument Panel Air Bag Stage 2 High Control	(1) I	(1) —
(2) 2	(2) —	(2) OG / VT	(2) 3026	(2) Passenger Instrument Panel Air Bag Stage 2 Low Control	(2) I	(2) —

F105L Front and Rear Row Roof Rail Airbag - Left



4679778

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35504154
- Service Connector: 85666124
- Description: 2-Way F ABX-5 Series(GY with YE Cover)

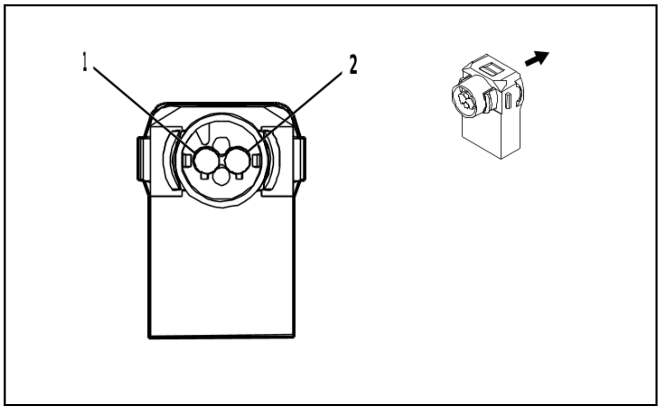
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F105L Front and Rear Row Roof Rail Airbag - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / GN	(1) 5019	(1) Left Front Roof Rail Air Bag High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / OG	(2) 5020	(2) Left Front Roof Rail Air Bag Low Control	(2) I	(2) —

F105LF Front Row Roof Rail Airbag - Left



4679778

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35504154
- Service Connector: 85666124
- Description: 2-Way F ABX-5 Series(GY with YE Cover)

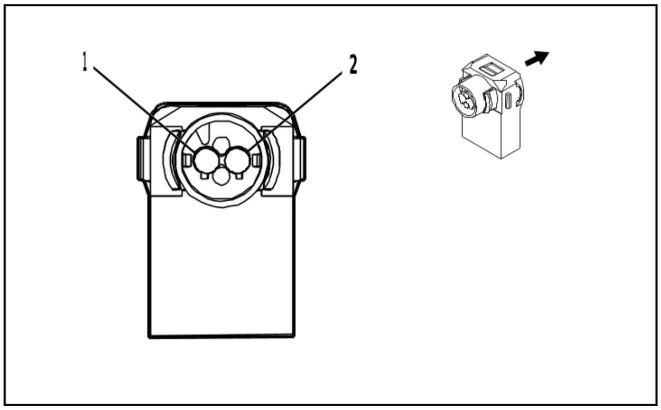
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F105LF Front Row Roof Rail Airbag - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / GN	(1) 5019	(1) Left Front Roof Rail Air Bag High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / OG	(2) 5020	(2) Left Front Roof Rail Air Bag Low Control	(2) I	(2) —

F105R Front and Rear Row Roof Rail Airbag - Right



4679778

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35504154
- Service Connector: 85666124
- Description: 2-Way F ABX-5 Series(GY with YE Cover)

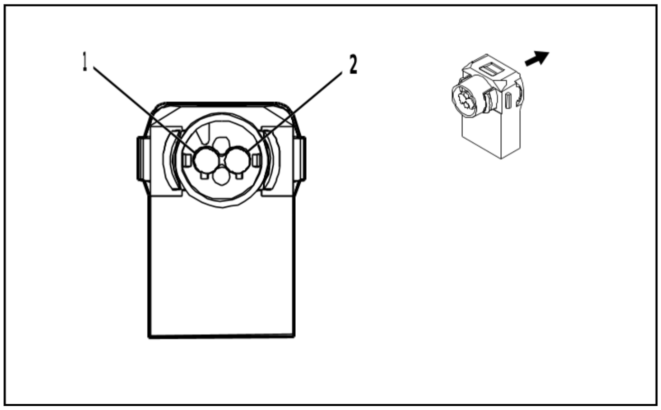
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F105R Front and Rear Row Roof Rail Airbag - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / GY	(1) 5021	(1) Right Front Roof Rail Air Bag High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / OG	(2) 5022	(2) Right Front Roof Rail Air Bag Low Control	(2) I	(2) —

F105RF Front Row Roof Rail Airbag - Right



4679778

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35504154
- Service Connector: 85666124
- Description: 2-Way F ABX-5 Series(GY with YE Cover)

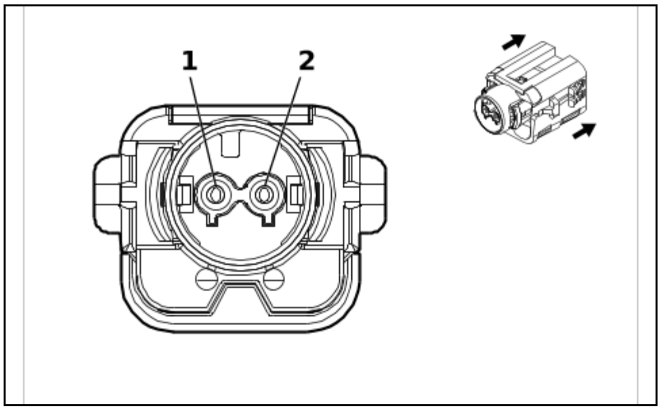
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F105RF Front Row Roof Rail Airbag - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / GY	(1) 5021	(1) Right Front Roof Rail Air Bag High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / OG	(2) 5022	(2) Right Front Roof Rail Air Bag Low Control	(2) I	(2) —

F106D Front Seat Outboard Seat Back Airbag - Driver



5499727

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 35212936
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F ABX-5 Series(PK with YE Cover)

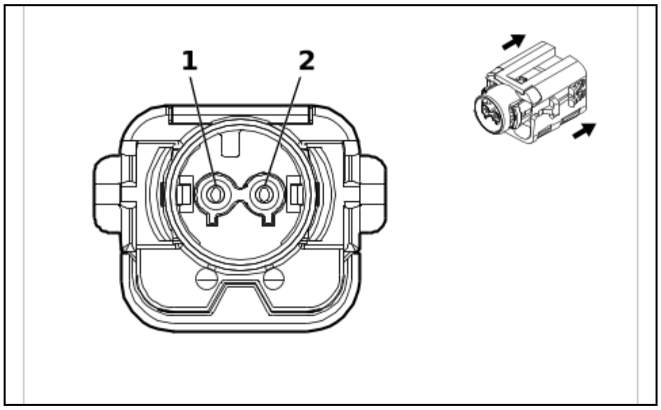
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F106D Front Seat Outboard Seat Back Airbag - Driver

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / BU	(1) 4962	(1) Driver Seat Back Air Bag High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / OG	(2) 4963	(2) Driver Seat Back Air Bag Low Control	(2) I	(2) —

F106P Front Seat Outboard Seat Back Airbag - Passenger



5499727

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 35212936
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F ABX-5 Series(PK with YE Cover)

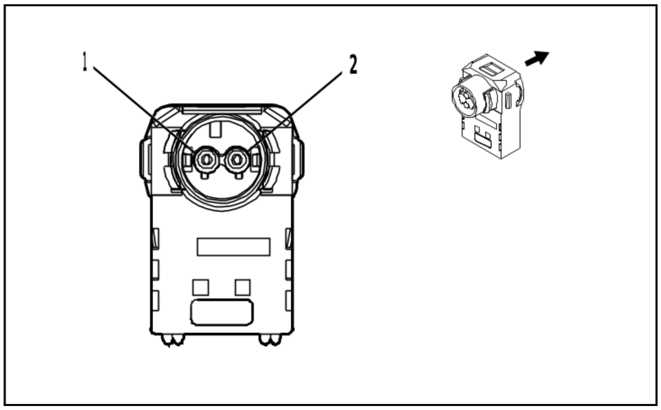
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F106P Front Seat Outboard Seat Back Airbag - Passenger

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / GY	(1) 4956	(1) Passenger Seat Back Air Bag High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / OG	(2) 4957	(2) Passenger Seat Back Air Bag Low Control	(2) I	(2) —

F107 Steering Wheel Airbag X1



4231869

Connector Part Information
- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 35504152
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F ABX-5 Series(PK with YE Cover)

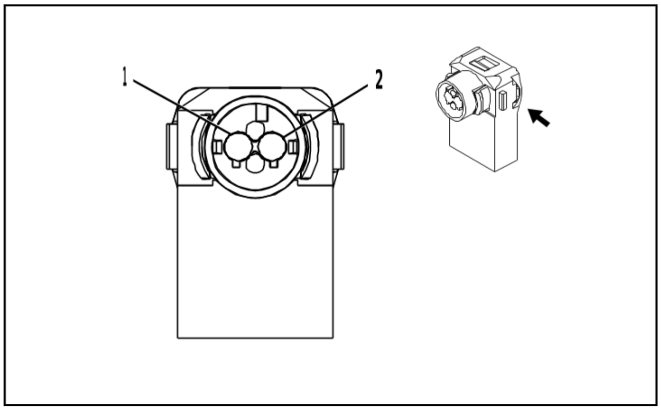
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F107 Steering Wheel Airbag X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5 (1) 0.5	(1) OG / VT (1) YE / OG	(1) 3021 (1) 3021	(1) Steering Wheel Air Bag Stage 1 High Control (1) Steering Wheel Air Bag Stage 1 High Control	(1) I (1) I	(1) — (1) —
(2) 2	(2) 0.5 (2) 0.5	(2) BN / OG (2) OG / WH	(2) 3020 (2) 3020	(2) Steering Wheel Air Bag Stage 1 Low Control (2) Steering Wheel Air Bag Stage 1 Low Control	(2) I (2) I	(2) — (2) —

F107 Steering Wheel Airbag X2



4241364

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 35504153
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F ABX-5 Series(PU with YE Cover)

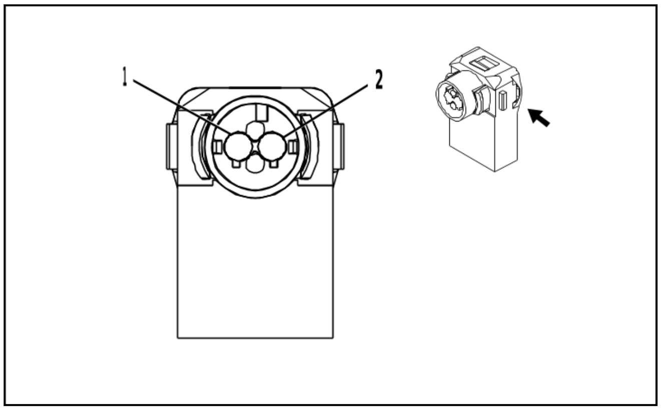
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F107 Steering Wheel Airbag X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5 (1) 0.5	(1) GY / OG (1) OG / GN	(1) 3023 (1) 3023	(1) Steering Wheel Air Bag Stage 2 High Control (1) Steering Wheel Air Bag Stage 2 High Control	(1) I (1) I	(1) — (1) —
(2) 2	(2) 0.5 (2) 0.5	(2) OG / VT (2) WH / OG	(2) 3022 (2) 3022	(2) Steering Wheel Air Bag Stage 2 Low Control (2) Steering Wheel Air Bag Stage 2 Low Control	(2) I (2) I	(2) — (2) —

F112D Front Seat Belt Retractor - Driver



4241364

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35504153
- Service Connector: 85666123
- Description: 2-Way F ABX-5 Series(PU with YE Cover)

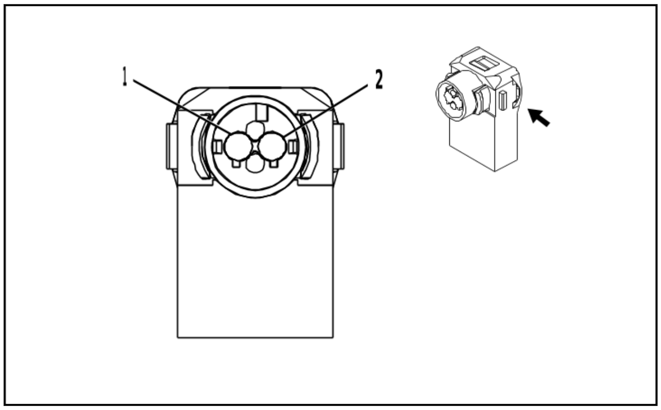
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F112D Front Seat Belt Retractor - Driver

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / WH	(1) 3477	(1) Driver Seat Belt Retractor Pretensioner High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / OG	(2) 3478	(2) Driver Seat Belt Retractor Pretensioner Low Control	(2) I	(2) —

F112P Front Seat Belt Retractor - Passenger



4241364

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35504153
- Service Connector: 85666123
- Description: 2-Way F ABX-5 Series(PU with YE Cover)

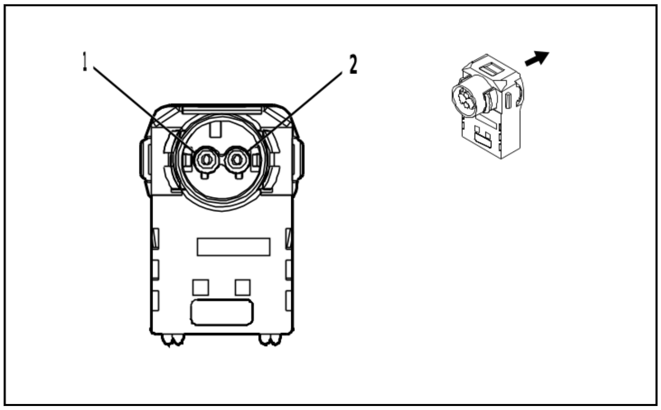
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F112P Front Seat Belt Retractor - Passenger

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / GN	(1) 3475	(1) Passenger Seat Belt Retractor Pretensioner High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / OG	(2) 3476	(2) Passenger Seat Belt Retractor Pretensioner Low Control	(2) I	(2) —

F113D Front Seat Belt Anchor Plate Tensioner - Driver



4231869

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35504152
- Service Connector: 85666122
- Description: 2-Way F ABX-5 Series(PK with YE Cover)

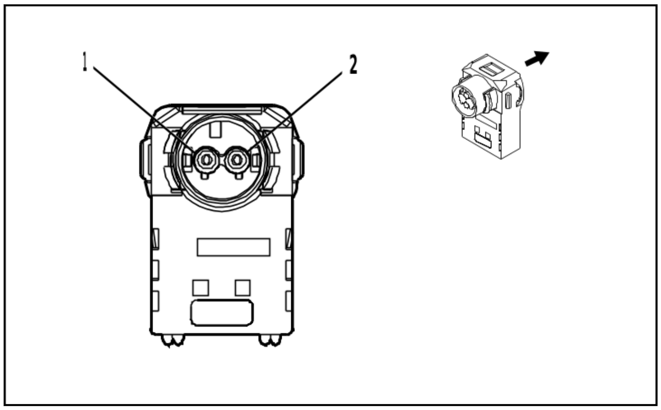
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F113D Front Seat Belt Anchor Plate Tensioner - Driver

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / YE	(1) 3481	(1) Driver Seat Belt Anchor Pretensioner High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / OG	(2) 3482	(2) Driver Seat Belt Anchor Pretensioner Low Control	(2) I	(2) —

F113P Front Seat Belt Anchor Plate Tensioner - Passenger



4231869

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35504152
- Service Connector: 85666122
- Description: 2-Way F ABX-5 Series(PK with YE Cover)

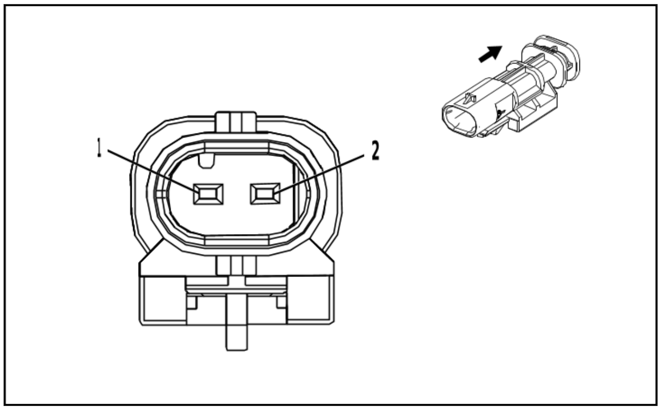
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-10 (GN)	No Tool Required

F113P Front Seat Belt Anchor Plate Tensioner - Passenger

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) OG / BN	(1) 3479	(1) Passenger Seat Belt Anchor Pretensioner High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY / OG	(2) 3480	(2) Passenger Seat Belt Anchor Pretensioner Low Control	(2) I	(2) —

G12AX Fuel Pump - Auxiliary (L5P)



2474755

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 2203314-1
- Service Connector: 85533165
- Description: 2-Way M 1.2 MCON Series, Sealed(BK)

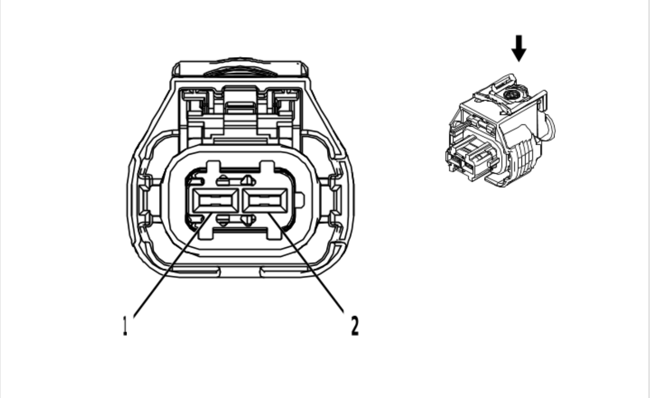
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

G12AX Fuel Pump - Auxiliary (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) BU / GN	(1) 2120	(1) Secondary Fuel Pump Control	(1) I	(1) —
(2) 2	(2) 1	(2) BK / GN	(2) 1580	(2) Fuel Pump Low Reference	(2) I	(2) —

G13 Generator X1 (- VYU)



2577394

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 1 928 405 714
- Service Connector: 13384371
- Description: 2-Way F 2.8 Series, Sealed(BK)

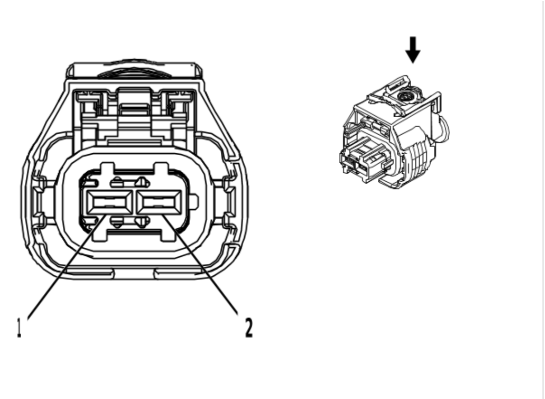
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

G13 Generator X1 (- VYU)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 25	(1) Charge Indicator Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 23	(2) Generator Field Duty Cycle Signal	(2) I	(2) —

G13 Generator X1 (VYU)



2577394

Connector Part Information

- Harness Type: Accessory Wiring Harness
- OEM Connector: 1 928 405 714
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 2.8 Series, Sealed(BK)

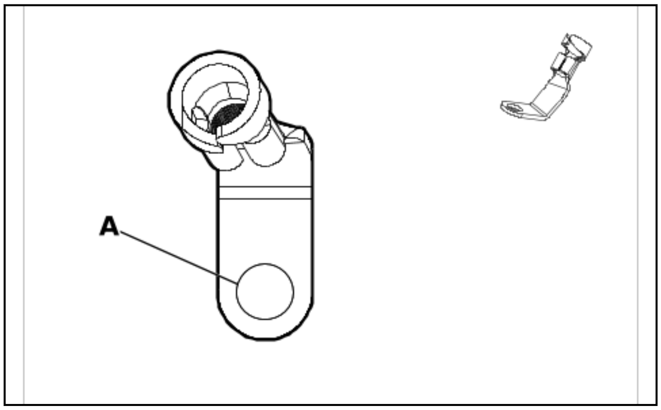
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

G13 Generator X1 (VYU)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 25	(1) Charge Indicator Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 23	(2) Generator Field Duty Cycle Signal	(2) I	(2) —

G13 Generator X2



6444138

Connector Part Information

- Harness Type: Generator Battery Jumper Cable
- OEM Connector: 84386100
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

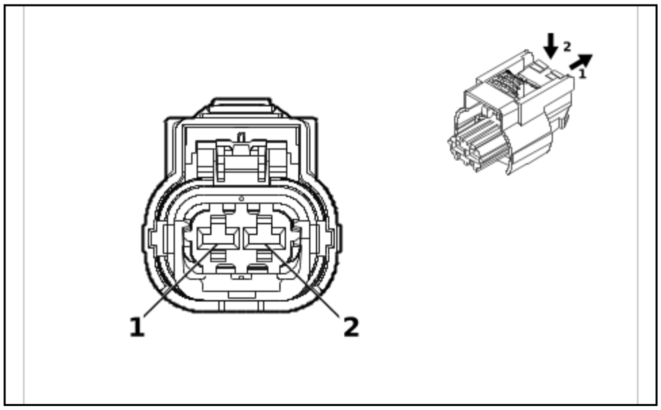
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

G13 Generator X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	35	RD / YE	2	Battery Positive Voltage	I	L5P
	35	RD / YE	2	Battery Positive Voltage	I	L8T

G13A Auxiliary Generator X1 (- VYU)



4992524

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 35182447
- Service Connector: 84941154
- Description: 2-Way F 2.8 MCP Series, Sealed(BK)

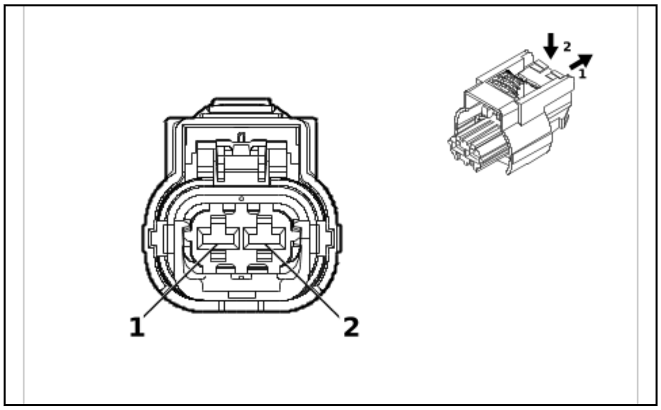
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

G13A Auxiliary Generator X1 (- VYU)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 25	(1) Charge Indicator Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 23	(2) Generator Field Duty Cycle Signal	(2) I	(2) —

G13A Auxiliary Generator X1 (VYU)



4992524

Connector Part Information
- Harness Type: Accessory Wiring Harness
- OEM Connector: 35182447
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 2.8 MCP Series, Sealed(BK)

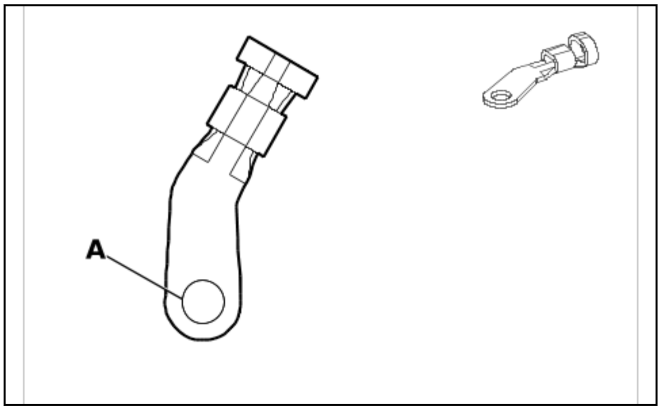
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

G13A Auxiliary Generator X1 (VYU)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 25	(1) Charge Indicator Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 23	(2) Generator Field Duty Cycle Signal	(2) I	(2) —

G13A Auxiliary Generator X2 (L5P)



6444786

Connector Part Information
- Harness Type: Auxiliary Generator Battery Jumper Cable
- OEM Connector: 84223343
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

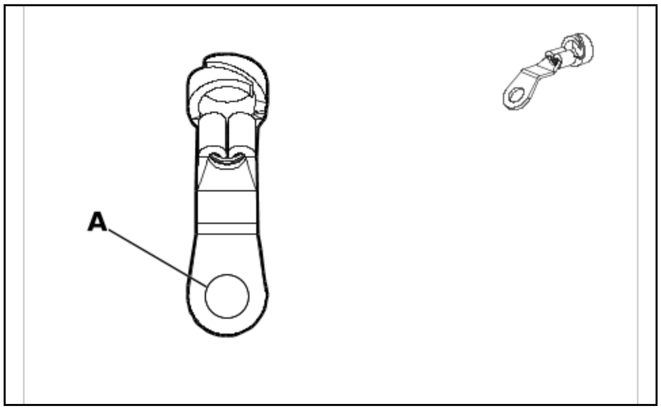
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

G13A Auxiliary Generator X2 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / YE	2	Battery Positive Voltage	I	KHF+ L5P

G13A Auxiliary Generator X2 (L8T)



6444145

Connector Part Information
- Harness Type: Auxiliary Generator Battery Jumper Cable
- OEM Connector: 13531265
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

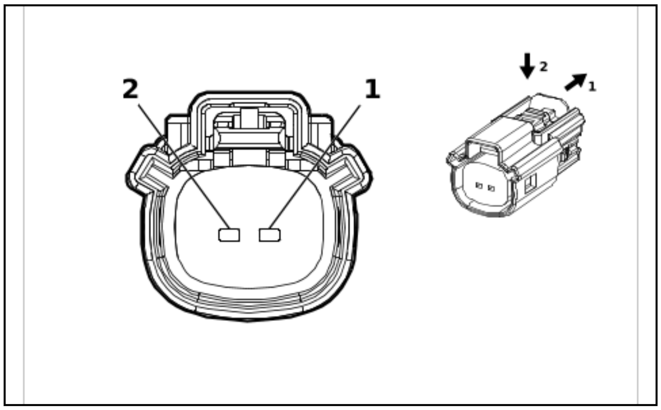
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

G13A Auxiliary Generator X2 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	25	RD / YE	2	Battery Positive Voltage	I	KHF+ L8T

G18 Fuel Pump - High Pressure



2474713

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Right
- OEM Connector: 33471-0206
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

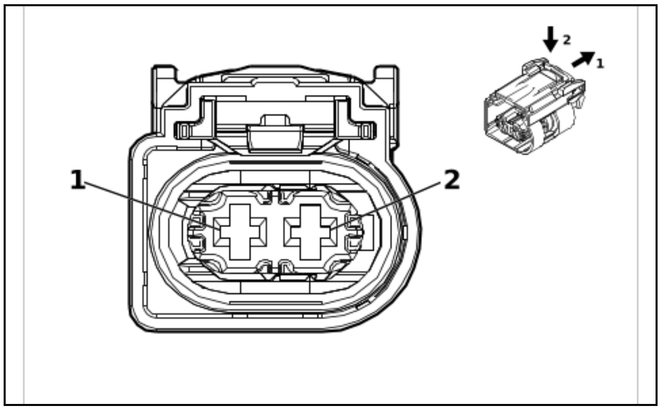
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

G18 Fuel Pump - High Pressure

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / BK	(1) 7300	(1) High Pressure Fuel Pump Low Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) YE	(2) 7301	(2) High Pressure Fuel Pump High Control	(2) I	(2) —

G24 Windshield Washer Pump



5580410

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 2425741-1
- Service Connector: 85005016
- Description: 2-Way F 2.8 MCP Series, Sealed(BK)

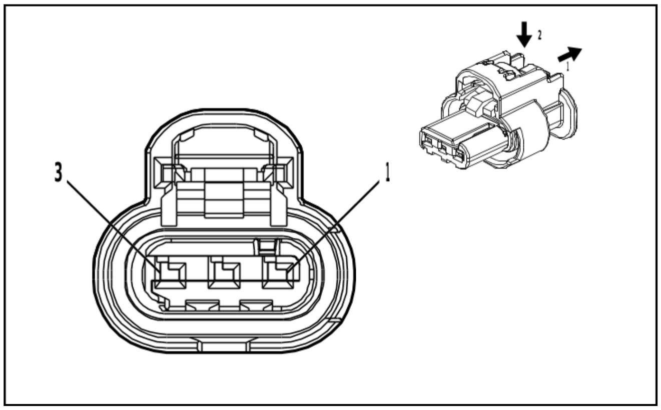
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

G24 Windshield Washer Pump

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GY / VT	(1) 228	(1) Windshield Washer Pump Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) BK	(2) 150	(2) Ground	(2) I	(2) —

G73 Low Temperature Loop Coolant Pump



4581126

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 1-2296695-1
- Service Connector: 86792094
- Description: 3-Way F 1.2 MCON-CB Series, Sealed(BK)

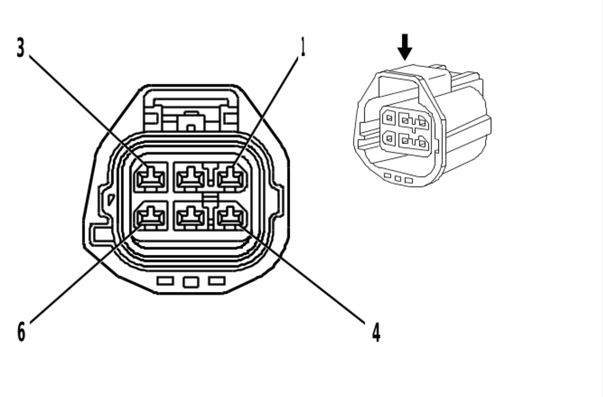
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

G73 Low Temperature Loop Coolant Pump

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) BK	(1) 6150	(1) Engine Odd Bank Ground	(1) I	(1) —
(2) 2	(2) 1	(2) VT / BU	(2) 5294	(2) Powertrain Main Relay Fused Supply Voltage 5	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN / VT	(3) 4621	(3) Engine Control Module LIN Bus 1	(3) I	(3) —

K4 Running Board Control Module X1



1420587

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 7287-9814-10
- Service Connector: 19368306
- Description: 6-Way F 2.8 Series, Sealed(GY)

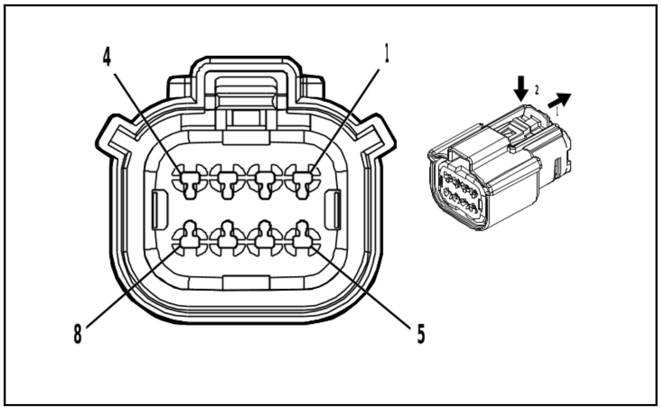
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

K4 Running Board Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) RD / WH	(1) 1040	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 2	(2) GY	(2) 7472	(2) Left Running Board Step Motor Control Retract	(2) I	(2) —
(3) 3	(3) 2	(3) BU	(3) 7470	(3) Right Running Board Step Motor Control Extend	(3) I	(3) —
(4) 4	(4) 2.5	(4) BK / WH	(4) 1151	(4) Signal Ground	(4) I	(4) —
(5) 5	(5) 2	(5) WH / BN	(5) 7471	(5) Left Running Board Step Motor Control Extend	(5) I	(5) —
(6) 6	(6) 2	(6) GN	(6) 7469	(6) Right Left Running Board Step Motor Control Retract	(6) I	(6) —

K4 Running Board Control Module X2



4846407

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 33472-4806
- Service Connector: 84928314
- Description: 8-Way F 1.5 MX Series, Sealed(BK)

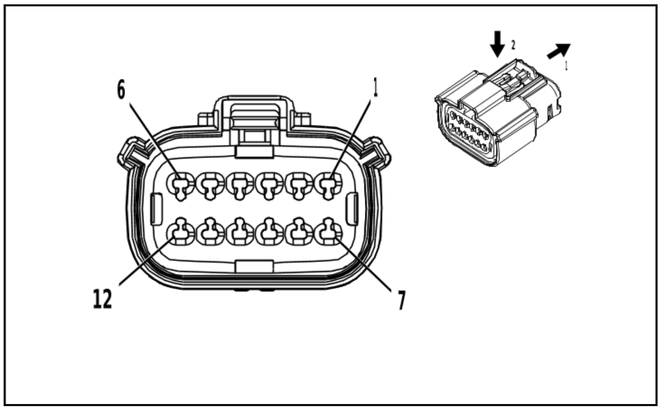
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

K4 Running Board Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 4986	(1) AUTOSAR CAN Bus [-] 1 Serial Data	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH	(2) 4986	(2) AUTOSAR CAN Bus [-] 1 Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU	(3) 4987	(3) AUTOSAR CAN Bus [+] 1 Serial Data	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) BU	(5) 4987	(5) AUTOSAR CAN Bus [+] 1 Serial Data	(5) I	(5) —
(6) 6	(6) 0.5	(6) WH	(6) 4986	(6) AUTOSAR CAN Bus [-] 1 Serial Data	(6) I	(6) —
(7) 7	(7) 0.5	(7) BU	(7) 4987	(7) AUTOSAR CAN Bus [+] 1 Serial Data	(7) I	(7) —
8	—	—	—	Not Occupied	—	—

K4 Running Board Control Module X3



2871860

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 33472-6223
- Service Connector: 19352907
- Description: 12-Way F 1.5 MX Series, Sealed(BK)

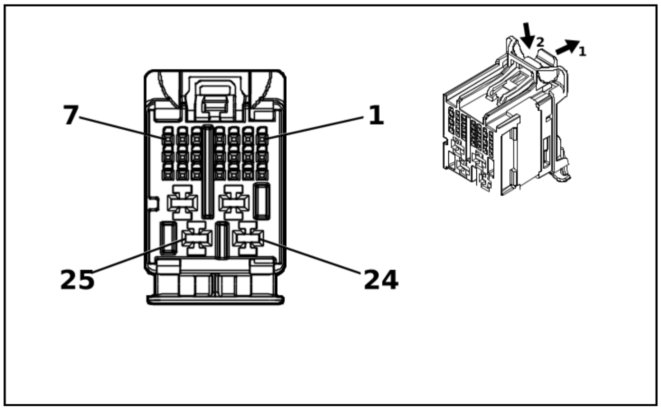
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85528055	J-35616-2A (GY)	J-38125-217

K4 Running Board Control Module X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / RD	(1) 7464	(1) Right Running Board Step Motor Hall Sensor 5V Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT	(2) 7465	(2) Right Running Board Step Motor Hall Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / BK	(3) 7463	(3) Right Running Board Step Motor Hall Sensor Low Reference	(3) I	(3) —
(4) 4	(4) 0.5	(4) BN	(4) 4748	(4) Left Running Board Step Courtesy Lamp Control	(4) I	(4) —
(5) 5	(5) 0.5	(5) GY / VT	(5) 4749	(5) Right Running Board Step Courtesy Lamp Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) VT / RD	(7) 7468	(7) Left Running Board Step Motor Hall Sensor 5V Reference	(7) I	(7) —
(8) 8	(8) 0.5	(8) YE	(8) 7467	(8) Left Running Board Step Motor Hall Sensor Signal	(8) I	(8) —
(9) 9	(9) 0.5	(9) YE / BN	(9) 7466	(9) Left Running Board Step Motor Hall Sensor Low Reference	(9) I	(9) —
10 - 12	—	—	—	Not Occupied	—	—

K9 Body Control Module X1



5203995

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160027-0013
- Service Connector: 13534967
- Description: 25-Way F 0.5 MQS, 2.8 MCP Series(BK with GY Inner Connector)

Terminal Part Information

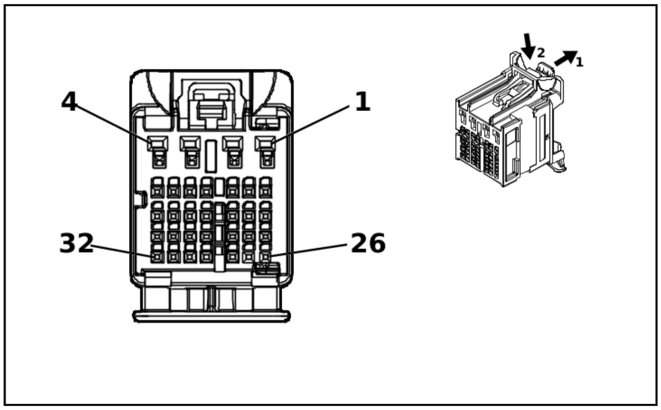
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19370262	EL-35616-58 (BK)	EL-38125-58
II	87814662	J-35616-35 (VT)	J-38125-557

K9 Body Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.35	(2) BU / GN	(2) 4248	(2) Cargo Lamp Indicator Control	(2) I	(2) —
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.35	(5) BU / GY	(5) 754	(5) Blower Motor Speed Control	(5) I	(5) —
(6) 6	(6) 0.35	(6) WH / YE	(6) 4634	(6) HVAC Remote Enable Signal	(6) I	(6) —
(7) 7	(7) 0.35	(7) WH / GY	(7) 7297	(7) Minor Endgate High Relay Control	(7) I	(7) —
8 - 10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) GY / GN	(11) 4636	(11) HVAC System Enable Signal	(11) I	(11) —
(12) 12	(12) 0.35	(12) GY	(12) 728	(12) Security Indicator Control	(12) I	(12) —
(13) 13	(13) 0.35	(13) YE	(13) 6812	(13) Out of Park Signal	(13) I	(13) —
(14) 14	(14) 0.35	(14) BN / BU	(14) 4892	(14) Auxiliary Battery Relay Control	(14) I	(14) —
(15) 15	(15) 0.35	(15) GY	(15) 590	(15) Driver Solar Sensor Signal	(15) I	(15) —
(16) 16	(16) 0.35	(16) GY	(16) 6137	(16) Air Conditioning Evaporator Temperature Sensor Signal	(16) I	(16) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(17) 17	(17) 0.35	(17) WH / BU	(17) 278	(17) Ambient Light Sensor Signal	(17) I	(17) —
(18) 18	(18) 0.35	(18) BU / WH	(18) 734	(18) Inside Air Temperature Sensor Signal	(18) I	(18) —
(19) 19	(19) 0.35	(19) GY	(19) 158	(19) Cargo Lamp Switch Signal	(19) I	(19) —
(20) 20	(20) 0.35	(20) GN / VT	(20) 2852	(20) Body Control Module LIN Bus 6	(20) I	(20) —
21 - 22	—	—	—	Not Occupied	—	—
(23) 23	(23) 1	(23) RD / GY	(23) 2140	(23) Battery Positive Voltage	(23) II	(23) —
24	—	—	—	Not Occupied	—	—
(25) 25	(25) 1	(25) GN / YE	(25) 6840	(25) Auxiliary Device 2 Switched Voltage	(25) II	(25) —

K9 Body Control Module X2



5204222

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160028-0015
- Service Connector: 13534980
- Description: 32-Way F 0.5 NANO, 1.2 MCON, stAK50h Series(PK with GY Inner Connector)

Terminal Part Information

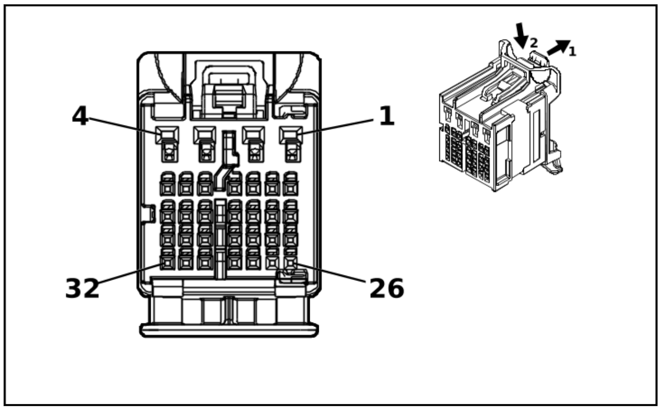
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

K9 Body Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.35	(5) BU / GN	(5) 5723	(5) Ignition Mode Switch Mode Voltage	(5) I	(5) —
6 - 8	—	—	—	Not Occupied	—	—
(9) 9	(9) 0.35	(9) GN / BU	(9) 3738	(9) Tap Up/Tap Down Switch Signal 2	(9) I	(9) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(10) 10	(10) 0.35	(10) WH / BN	(10) 2203	(10) Enhanced Driver Mode 2 Switch Signal	(10) I	(10) —
(11) 11	(11) 0.35	(11) GY	(11) 1198	(11) Endgate Release Switch Analog Signal Interior	(11) I	(11) —
(12) 12	(12) 0.35	(12) YE / BU	(12) 1714	(12) Windshield Wiper Switch Low Signal	(12) I	(12) —
(13) 13	(13) 0.35	(13) GY / GN	(13) 5737	(13) Distance Sensing Cruise Control Gap Up/ Down Switch Signal	(13) I	(13) —
(14) 14	(14) 0.35	(14) BN / GN	(14) 1884	(14) Cruise Control Set/Coast/Resume/ Accelerate Switch Signal	(14) I	(14) —
15	—	—	—	Not Occupied	—	—
(16) 16	(16) 0.35	(16) BN / BK	(16) 5720	(16) Ignition Mode Switch Accessory LED Signal	(16) I	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.35	(18) YE / BU	(18) 2912	(18) Driver Mode 2 Indicator Control	(18) I	(18) —
(19) 19	(19) 0.35	(19) WH / VT	(19) 103	(19) Headlamp Switch On Signal	(19) I	(19) —
(20) 20	(20) 0.35	(20) GN / GY	(20) 13	(20) Headlamp Switch Park Lamp Signal	(20) I	(20) —
(21) 21	(21) 0.35	(21) GN / BN	(21) 306	(21) Headlamp Switch Off Signal	(21) I	(21) —
(22) 22	(22) 0.35	(22) GY	(22) 4989	(22) Driver Mode 2 Switch Signal	(22) I	(22) —
(23) 23	(23) 0.35	(23) VT / BU	(23) 2916	(23) Right Turn Signal Switch Signal	(23) I	(23) —
24	—	—	—	Not Occupied	—	—
(25) 25	(25) 0.35	(25) BK / GY	(25) 6009	(25) Windshield Wiper Switch Low Reference	(25) I	(25) —
(26) 26	(26) 0.35	(26) WH / BK	(26) 94	(26) Windshield Washer Switch Signal	(26) I	(26) —
(27) 27	(27) 0.35	(27) YE / BN	(27) 307	(27) Headlamp Switch Flash Signal	(27) I	(27) —
(28) 28	(28) 0.35	(28) GN / WH	(28) 3287	(28) Horn Switch Signal	(28) I	(28) —
(29) 29	(29) 0.35	(29) WH / GN	(29) 2915	(29) Left Turn Signal Switch Signal	(29) I	(29) —
(30) 30	(30) 0.35	(30) BK / YE	(30) 407	(30) Sensor Low Reference	(30) I	(30) —
(31) 31	(31) 0.35	(31) GN / WH	(31) 111	(31) Hazard Warning Switch Signal	(31) I	(31) —
(32) 32	(32) 0.35	(32) WH	(32) 524	(32) High Beam Select Switch High Beam Signal	(32) I	(32) —

K9 Body Control Module X3



5203925

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160028-0012
- Service Connector: 13534977
- Description: 32-Way F 0.5 NANO, 1.2 MCON, stAK50h Series(BU with GY Inner Connector)

Terminal Part Information

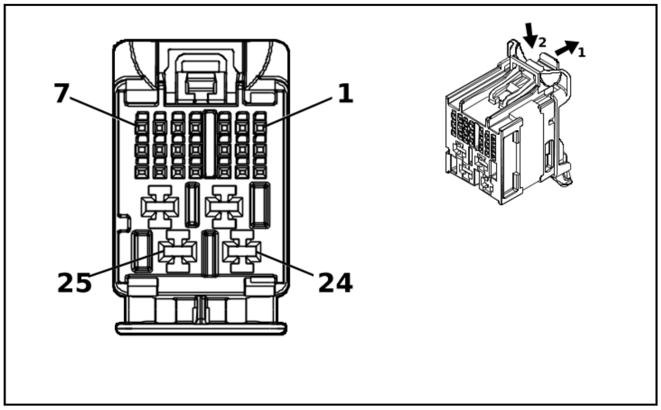
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

K9 Body Control Module X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) GN / VT	(3) 4786	(3) Dome/Reading Lamp Enable Signal	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.35	(7) WH / BN	(7) 7555	(7) Headlamp Switch Signal	(7) I	(7) —
8 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.35	(10) GN / BK	(10) 2858	(10) Body Control Module LIN Bus 12	(10) I	(10) —
11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.35	(12) YE / WH	(12) 816	(12) Brake Transmission Shift Interlock Solenoid Actuator Control	(12) I	(12) —
(13) 13	(13) 0.35	(13) WH	(13) 3152	(13) Lane Departure Warning Indicator Control	(13) I	(13) —
(14) 14	(14) 0.35	(14) GN / BN	(14) 5852	(14) Rear Parking Assist Disable LED Signal	(14) I	(14) —
15	—	—	—	Not Occupied	—	—
(16) 16	(16) 0.35	(16) GN / BU	(16) 761	(16) Blower Speed Feedback Signal	(16) I	(16) —
(17) 17	(17) 0.35	(17) WH / VT	(17) 5905	(17) Key Capture/Column Lock Shift Position Signal	(17) I	(17) —
(18) 18	(18) 0.35	(18) YE	(18) 7556	(18) Headlamp Switch Reference	(18) I	(18) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(19) 19	(19) 0.35	(19) BU / BK	(19) 5719	(19) Ignition Mode Switch Start LED Signal	(19) I	(19) —
20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.35	(21) BN	(21) 7291	(21) Major Endgate Release Switch Signal Interior	(21) I	(21) —
22 - 23	—	—	—	Not Occupied	—	—
(24) 24	(24) 0.35	(24) WH / BU	(24) 3691	(24) Trailer Brake Apply Signal	(24) I	(24) —
(25) 25	(25) 0.35	(25) BU / GY	(25) 4990	(25) Driver Mode 1 Switch Signal	(25) I	(25) —
(26) 26	(26) 0.35	(26) GY / BN	(26) 3904	(26) Auto High Beam Assist Switch Signal	(26) I	(26) —
(27) 27	(27) 0.35	(27) GY / WH	(27) 3153	(27) Lane Departure Warning Disable Switch Signal	(27) I	(27) —
28 - 29	—	—	—	Not Occupied	—	—
(30) 30	(30) 0.35	(30) BU / YE	(30) 6844	(30) ABS/Traction Control Hill Descent Control Switch Signal	(30) I	(30) —
(31) 31	(31) 0.35	(31) GY / GN	(31) 2555	(31) Rear Parking Assist Disable Signal	(31) I	(31) —
32	—	—	—	Not Occupied	—	—

K9 Body Control Module X4



5203893

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160027-0018
- Service Connector: 13534970
- Description: 25-Way F 0.5 MQS, 2.8 MCP Series(GY)

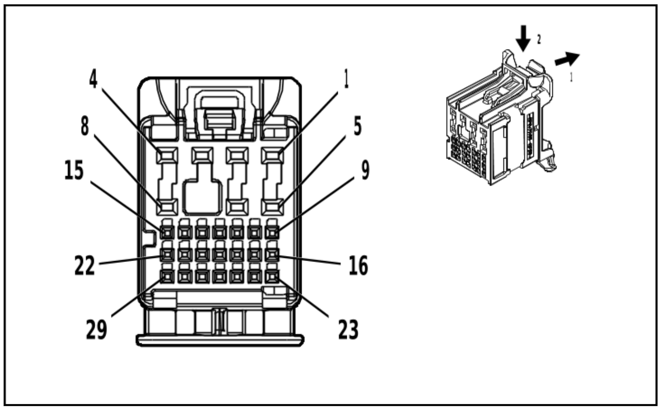
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19370262	EL-35616-58 (BK)	EL-38125-58
II	87814662	J-35616-35 (VT)	J-38125-557

K9 Body Control Module X4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BN / BK	(1) 3552	(1) Interior Passive Entry Antenna 1 High Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) WH	(2) 3553	(2) Interior Passive Entry Antenna 1 Low Signal	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK / VT	(3) 1449	(3) Steering Wheel Resistor Ladder Low Reference	(3) I	(3) —
(4) 4	(4) 0.35	(4) WH / GN	(4) 7728	(4) Major Endgate High Relay Control	(4) I	(4) —
(5) 5	(5) 0.35	(5) GN / VT	(5) 5199	(5) Run/Crank Relay Coil Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.35	(7) BN / BK	(7) 4996	(7) Immobilizer Antenna Signal [+]	(7) I	(7) —
8 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.35	(10) GY / GN	(10) 4083	(10) Retained Accessory Power Relay 2 Coil Control	(10) I	(10) —
(11) 11	(11) 0.35	(11) BU / YE	(11) 7176	(11) All Windows Open Switch Signal	(11) I	(11) —
(12) 12	(12) 0.35	(12) BU / VT	(12) 7729	(12) Major Endgate Low Relay Control	(12) I	(12) —
13	—	—	—	Not Occupied	—	—
(14) 14	(14) 0.35	(14) WH / GY	(14) 4997	(14) Immobilizer Antenna Low Signal	(14) I	(14) —
(15) 15	(15) 0.35	(15) BU / VT	(15) 1788	(15) Traction Control Switch Signal 1	(15) I	(15) —
(16) 16	(16) 0.35	(16) GN / WH	(16) 4115	(16) Body Control Module LIN Bus 5	(16) I	(16) —
17 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.35	(19) BU / YE	(19) 4979	(19) AUTOSAR CAN Bus [+] 2 Serial Data	(19) I	(19) —
(20) 20	(20) 0.35	(20) WH	(20) 4978	(20) AUTOSAR CAN Bus [-] 2 Serial Data	(20) I	(20) —
(21) 21	(21) 0.35	(21) WH	(21) 6816	(21) Indicator Dimming Control	(21) I	(21) —
(22) 22	(22) 0.5	(22) RD / WH	(22) 2740	(22) Battery Positive Voltage	(22) II	(22) —
(23) 23	(23) 2	(23) RD / BU	(23) 2540	(23) Battery Positive Voltage	(23) II	(23) —
(24) 24	(24) 1	(24) BK	(24) 1050	(24) Ground	(24) II	(24) —
(25) 25	(25) 1	(25) BK	(25) 1050	(25) Ground	(25) II	(25) —

K9 Body Control Module X5



4584346

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 160014-0012
- Service Connector: 13534972
- Description: 29-Way F 0.5 NANO, 1.2 MCON Series(GN)

Terminal Part Information

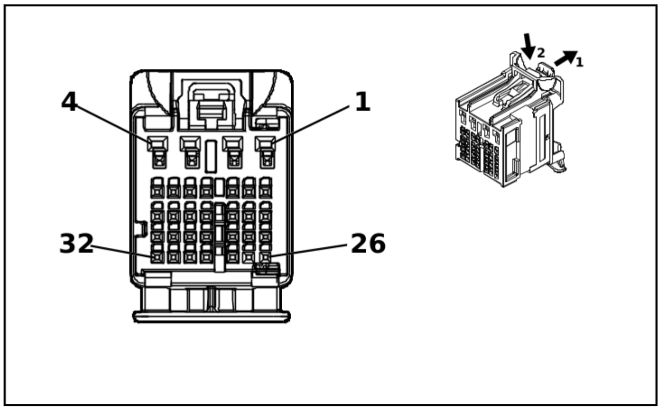
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

K9 Body Control Module X5

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.5	(2) BU / BN	(2) 7573	(2) Air Conditioning Compressor Solenoid Valve Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / YE	(3) 7574	(3) Air Conditioning Compressor Solenoid Valve Control	(3) I	(3) —
(4) 4	(4) 0.75	(4) WH	(4) 2679	(4) Lock Actuators Unlock Control 1	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.5	(6) YE	(6) 6817	(6) LED Backlight Dimming Control 1	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.75	(8) GY	(8) 2681	(8) Left Front Door Lock Actuator Lock Control	(8) I	(8) —
9 - 10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) BN / WH	(11) 28	(11) Horn Relay Control	(11) I	(11) —
(12) 12	(12) 0.35	(12) WH	(12) 4978	(12) AUTOSAR CAN Bus [-] 2 Serial Data	(12) I	(12) —
(13) 13	(13) 0.35	(13) BU / YE	(13) 4979	(13) AUTOSAR CAN Bus [+] 2 Serial Data	(13) I	(13) —
14 - 15	—	—	—	Not Occupied	—	—
(16) 16	(16) 0.35	(16) VT	(16) 4301	(16) Passive Entry Left Antenna Signal High	(16) I	(16) —
(17) 17	(17) 0.35	(17) GN / YE	(17) 2855	(17) Body Control Module LIN Bus 9	(17) I	(17) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(18) 18	(18) 0.35	(18) VT / GY	(18) 126	(18) Left Front Door Open Switch Signal	(18) I	(18) —
(19) 19	(19) 0.35	(19) GN / YE	(19) 6134	(19) Body Control Module LIN Bus 3	(19) I	(19) —
20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.35	(21) WH / BU	(21) 6311	(21) Cruise/ETC/TCC Brake Signal	(21) I	(21) —
(22) 22	(22) 0.35	(22) BN / VT	(22) 193	(22) Rear Defogger Relay Control	(22) I	(22) —
(23) 23	(23) 0.35	(23) VT / GY	(23) 4302	(23) Passive Entry Left Antenna Signal Low	(23) I	(23) —
(24) 24	(24) 0.35	(24) WH	(24) 5359	(24) Brake Apply Sensor Control	(24) I	(24) —
(25) 25	(25) 0.35	(25) BU / YE	(25) 5361	(25) Brake Apply Sensor Signal	(25) I	(25) —
(26) 26	(26) 0.35	(26) BK / BN	(26) 5360	(26) Brake Apply Sensor Low Reference	(26) I	(26) —
(27) 27	(27) 0.35	(27) YE	(27) 1144	(27) Endgate Release Switch Discrete Signal Exterior	(27) I	(27) —
28 - 29	—	—	—	Not Occupied	—	—

K9 Body Control Module X6



5202291

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 160028-0017
- Service Connector: 13534981
- Description: 32-Way F 0.5 MQS, 1.2 OCS Series(BN with GY Inner Connector)

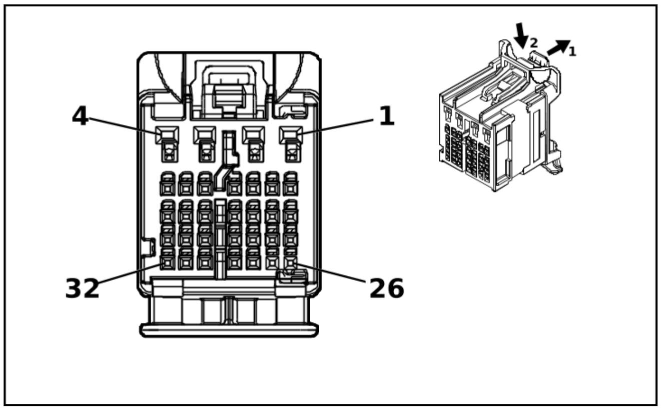
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

K9 Body Control Module X6

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.75	(2) VT / WH	(2) 1094	(2) Right Rear Door Lock Actuator Lock Control	(2) I	(2) —
(3) 3	(3) 0.75	(3) GY / BK	(3) 2680	(3) Lock Actuators Unlock Control 2	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.35	(7) BN / GN	(7) 3568	(7) Rear Closure Passive Entry Antenna High Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) GN / GY	(8) 3569	(8) Rear Closure Passive Entry Antenna Low Signal	(8) I	(8) —
9 - 10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) GN / BU	(11) 6133	(11) Body Control Module LIN Bus 2	(11) I	(11) —
(12) 12	(12) 0.35	(12) GY	(12) 7292	(12) Major Endgate Release Switch Signal Exterior	(12) I	(12) —
13	—	—	—	Not Occupied	—	—
(14) 14	(14) 0.35	(14) VT	(14) 801	(14) Retained Accessory Power Control	(14) I	(14) —
15 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.35	(19) YE	(19) 7294	(19) Minor Endgate Release Switch Discrete Signal Exterior	(19) I	(19) —
20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.35	(21) YE / BU	(21) 7295	(21) Left Minor Endgate Ajar Signal	(21) I	(21) —
(22) 22	(22) 0.35	(22) BN / GN	(22) 4064	(22) Hood Status B Signal	(22) I	(22) —
23 - 27	—	—	—	Not Occupied	—	—
(28) 28	(28) 0.35	(28) BU	(28) 2675	(28) Left Front Exterior Door Handle Switch Unlock Signal	(28) I	(28) —
29 - 32	—	—	—	Not Occupied	—	—

K9 Body Control Module X7



5202294

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 160028-0014
- Service Connector: 13534979
- Description: 32-Way F 0.5 MQS, 1.2 OCS Series(PU with GY Inner Connector)

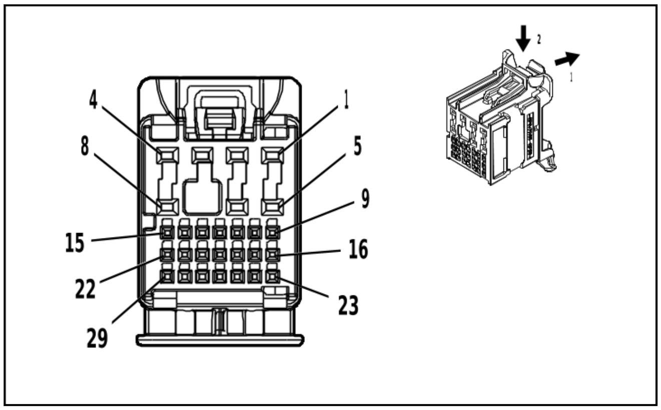
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

K9 Body Control Module X7

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 8	—	—	—	Not Occupied	—	—
(9) 9	(9) 0.35	(9) YE / WH	(9) 900	(9) —	(9) I	(9) —
10 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.35	(19) GN / VT	(19) 2857	(19) Body Control Module LIN Bus 11	(19) I	(19) —
(20) 20	(20) 0.35	(20) YE / BK	(20) 901	(20) —	(20) I	(20) —
21	—	—	—	Not Occupied	—	—
(22) 22	(22) 0.35	(22) YE / BU	(22) 902	(22) —	(22) I	(22) —
23 - 32	—	—	—	Not Occupied	—	—

K9 Body Control Module X8



4578560

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 160014-0011
- Service Connector: 13534971
- Description: 29-Way F 0.5 NANO, 1.2 MCON, stAK50h Series(DK-GY with GY Inner Connector)

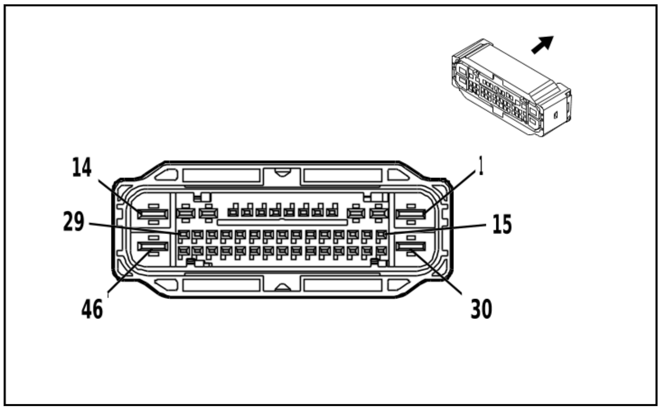
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

K9 Body Control Module X8

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.75	(3) BU / YE	(3) 1091	(3) Left Rear Door Lock Actuator Lock Control	(3) I	(3) —
(4) 4	(4) 0.75	(4) YE / GN	(4) 2682	(4) Right Front Door Lock Actuator Lock Control	(4) I	(4) —
5 - 8	—	—	—	Not Occupied	—	—
(9) 9	(9) 0.35	(9) GN / BK	(9) 4304	(9) Passive Entry Right Antenna Signal Low	(9) I	(9) —
(10) 10	(10) 0.35	(10) GN / YE	(10) 4303	(10) Passive Entry Right Antenna Signal High	(10) I	(10) —
11 - 16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.35	(17) GN / YE	(17) 2862	(17) Body Control Module LIN Bus 16	(17) I	(17) —
(18) 18	(18) 0.35	(18) GN / WH	(18) 2854	(18) Body Control Module LIN Bus 8	(18) I	(18) —
19 - 27	—	—	—	Not Occupied	—	—
(28) 28	(28) 0.35	(28) GY / VT	(28) 2676	(28) Right Front Door Exterior Switch Unlock Signal	(28) I	(28) —
(29) 29	(29) 0.35	(29) GN / GY	(29) 6135	(29) Body Control Module LIN Bus 4	(29) I	(29) —

K17 Electronic Brake Control Module



4162046

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35670689
- Service Connector: 85090369
- Description: 46-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(GY)

Terminal Part Information

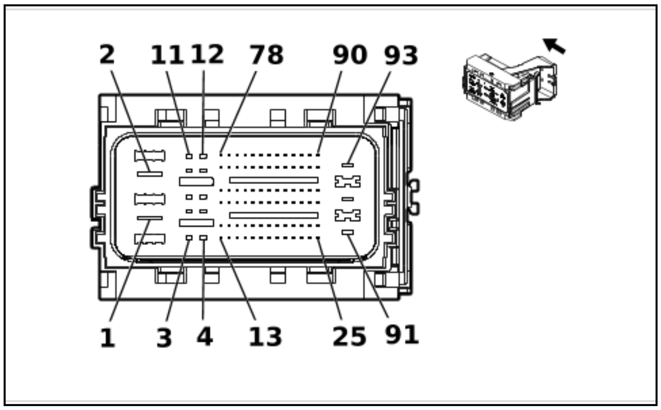
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13575368	J-35616-35 (VT)	J-38125-556
II	19370818	J-35616-12 (BU)	J-38125-553
III	84634921	J-35616-42 (RD)	J-38125-212

K17 Electronic Brake Control Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 6	(1) RD / WH	(1) 1642	(1) Battery Positive Voltage	(1) III	(1) —
(2) 2	(2) 2.5	(2) WH	(2) 2001	(2) Left Park Brake Motor Apply Control	(2) I	(2) —
(3) 3	(3) 2.5	(3) GY / BK	(3) 4369	(3) Left Park Brake Motor Low Reference	(3) I	(3) —
(4) 4	(4) 0.5	(4) GY / WH	(4) 7064	(4) Left Front Wheel Speed Sensor Control	(4) II	(4) —
(5) 5	(5) 0.5	(5) GY	(5) 830	(5) Left Front Wheel Speed Sensor Signal	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) BU / YE	(7) 4979	(7) AUTOSAR CAN Bus [+] 2 Serial Data	(7) II	(7) —
(8) 8	(8) 0.5	(8) WH	(8) 4978	(8) AUTOSAR CAN Bus [-] 2 Serial Data	(8) II	(8) —
(9) 9	(9) 0.5	(9) VT / WH	(9) 239	(9) Run/Crank Ignition 1 Voltage	(9) II	(9) —
(10) 10	(10) 0.5	(10) GY / BN	(10) 7065	(10) Right Front Wheel Speed Sensor Control	(10) II	(10) —
(11) 11	(11) 0.5	(11) YE	(11) 872	(11) Right Front Wheel Speed Sensor Signal	(11) II	(11) —
(12) 12	(12) 2.5	(12) GN / VT	(12) 1988	(12) Right Park Brake Motor Apply Control	(12) I	(12) —
(13) 13	(13) 2.5	(13) GY	(13) 4368	(13) Right Park Brake Motor Low Reference	(13) I	(13) —
(14) 14	(14) 4	(14) BK	(14) 150	(14) Ground	(14) III	(14) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(15) 15	(15) 0.5	(15) GY / BK	(15) 7127	(15) Left Rear Wheel Speed Sensor Control	(15) II	(15) —
(16) 16	(16) 0.5	(16) BU	(16) 884	(16) Left Rear Wheel Speed Sensor Signal	(16) II	(16) —
17 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.5	(19) BU / YE	(19) 4979	(19) AUTOSAR CAN Bus [+] 2 Serial Data	(19) II	(19) —
(20) 20	(20) 0.5	(20) WH	(20) 4978	(20) AUTOSAR CAN Bus [-] 2 Serial Data	(20) II	(20) —
21 - 22	—	—	—	Not Occupied	—	—
(23) 23	(23) 0.5	(23) GN / YE	(23) 2731	(23) Brake System Control Module LIN Bus 1	(23) II	(23) —
24 - 25	—	—	—	Not Occupied	—	—
(26) 26	(26) 0.5	(26) WH	(26) 4986	(26) AUTOSAR CAN Bus [-] 1 Serial Data	(26) II	(26) —
(27) 27	(27) 0.5	(27) GN / GY	(27) 333	(27) Brake Fluid Level Signal	(27) II	(27) —
(28) 28	(28) 0.5	(28) GY / YE	(28) 7128	(28) Right Rear Wheel Speed Sensor Control	(28) II	(28) —
(29) 29	(29) 0.5	(29) VT	(29) 882	(29) Right Rear Wheel Speed Sensor Signal	(29) II	(29) —
(30) 30	(30) 6	(30) RD / WH	(30) 1040	(30) Battery Positive Voltage	(30) III	(30) —
31 - 32	—	—	—	Not Occupied	—	—
(33) 33	(33) 0.35	(33) YE	(33) 10280	(33) Private Steering Angle CAN Bus [+] Serial Data	(33) II	(33) —
(34) 34	(34) 0.35	(34) BU / WH	(34) 10279	(34) Private Steering Angle CAN Bus [-] Serial Data	(34) II	(34) —
(35) 35	(35) 0.5	(35) GN / BU	(35) 2733	(35) Brake System Control Module LIN Bus 2	(35) II	(35) —
(36) 36	(36) 0.35	(36) GN / GY	(36) 817	(36) Vehicle Speed Signal	(36) II	(36) —
37 - 38	—	—	—	Not Occupied	—	—
(39) 39	(39) 0.5	(39) BN / BU	(39) 1602	(39) Front Brake Pad Wear Sensor Signal	(39) II	(39) —
(40) 40	(40) 0.5	(40) GN / YE	(40) 1616	(40) Rear Brake Pad Wear Sensor Signal	(40) II	(40) —
41	—	—	—	Not Occupied	—	—
(42) 42	(42) 0.5	(42) BU	(42) 4987	(42) AUTOSAR CAN Bus [+] 1 Serial Data	(42) II	(42) —
(43) 43	(43) 0.35	(43) GN / BN	(43) 2087	(43) Multi-axis Acceleration Sensor Supply Voltage	(43) II	(43) —
(44) 44	(44) 0.5	(44) WH / BK	(44) 2223	(44) Trailer Brake Apply Signal	(44) II	(44) —
(45) 45	(45) 0.5	(45) YE / BK	(45) 2224	(45) Trailer Brake Enable Signal	(45) II	(45) —
(46) 46	(46) 4	(46) BK	(46) 250	(46) Ground	(46) III	(46) —

K20 Engine Control Module X1 (L5P)



6173672

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 35659436
- Service Connector: 85079961
- Description: 93-Way F 0.5, 1.2, 2.8, 6.3 MX GENV Series, Sealed(BK with BU Terminal Position Assurance)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19355735	J-35616-4A (PU)	J-38125-217
II	85079962	EL-35616-58 (BK)	EL-38125-58
III	85079963	J-35616-16 (L-GN)	EL-38125-58
IV	85079964	J-35616-42 (RD)	J-38125-217

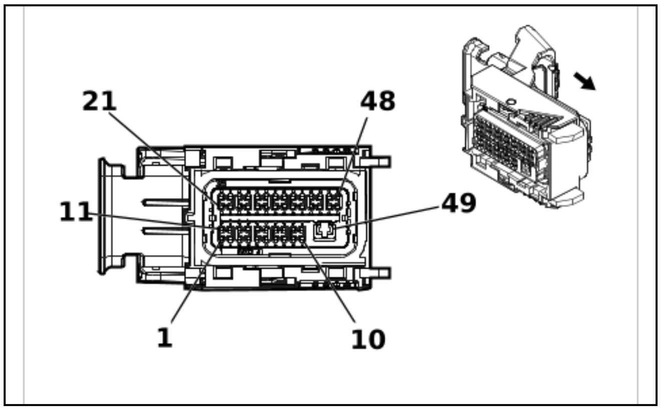
K20 Engine Control Module X1 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 4	(1) BK / WH	(1) 251	(1) Signal Ground	(1) IV	(1) —
(2) 2	(2) 4	(2) VT / BU	(2) 5290	(2) Powertrain Main Relay Fused Supply Voltage 1	(2) IV	(2) —
(3) 3	(3) 0.75	(3) RD / BN	(3) 440	(3) Battery Positive Voltage	(3) III	(3) —
(4) 4	(4) 0.75	(4) VT / GN	(4) 439	(4) Run/Crank Ignition 1 Voltage	(4) III	(4) —
(5) 5	(5) 0.5	(5) BU / GN	(5) 11437	(5) Secondary Fuel Pump Disable Signal	(5) III	(5) —
(6) 6	(6) 0.5	(6) GN / GY	(6) 465	(6) Fuel Pump Primary Relay Control	(6) III	(6) —
(7) 7	(7) 0.5	(7) VT / BN	(7) 2927	(7) Exhaust Aftertreatment Fuel Injector Low Control	(7) III	(7) —
(8) 8	(8) 0.5	(8) YE	(8) 5991	(8) Powertrain Relay Coil Control	(8) III	(8) —
(9) 9	(9) 0.5	(9) BN / BU	(9) 2926	(9) Exhaust Aftertreatment Fuel Injector High Control	(9) III	(9) —
(10) 10	(10) 0.5	(10) BN / WH	(10) 3100	(10) Diesel Exhaust Fluid Dosing Valve Low Control	(10) III	(10) —
(11) 11	(11) 0.5	(11) GN / BU	(11) 3889	(11) Powertrain Sensor Bus Relay Control	(11) III	(11) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(12) 12	(12) 0.5	(12) BN	(12) 3099	(12) Diesel Exhaust Fluid Dosing Valve High Control	(12) III	(12) —
(13) 13	(13) 0.5 (13) 0.5	(13) BN / YE (13) BK	(13) 11438 (13) 162	(13) Power Take Off Wakeup Signal (13) Folding Top Motor Up Control	(13) II (13) II	(13) — (13) —
(14) 14	(14) 0.5	(14) WH / BK	(14) 2366	(14) Cooling Fan Speed Control Signal	(14) II	(14) —
(15) 15	(15) 0.5	(15) BU	(15) 3017	(15) Fuel Heater Relay 1 Control	(15) II	(15) —
(16) 16	(16) 0.5	(16) WH / GY	(16) 459	(16) Air Conditioning Compressor Clutch Relay Control	(16) II	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.5	(18) YE / WH	(18) 1161	(18) Accelerator Pedal Position Signal 1	(18) II	(18) —
(19) 19	(19) 0.5	(19) WH / RD	(19) 1164	(19) Accelerator Pedal Position 5V Reference 1	(19) II	(19) —
(20) 20	(20) 0.5	(20) BN / RD	(20) 1274	(20) Accelerator Pedal Position 5V Reference 2	(20) II	(20) —
(21) 21	(21) 0.5	(21) GN / WH	(21) 1162	(21) Accelerator Pedal Position Signal 2	(21) II	(21) —
22	—	—	—	Not Occupied	—	—
(23) 23	(23) 0.5	(23) BU / GY	(23) 4054	(23) Private Serial Data Powertrain CAN Bus [-] Serial Data	(23) II	(23) —
(24) 24	(24) 0.5	(24) WH	(24) 4976	(24) AUTOSAR CAN Bus [-] 3 Serial Data	(24) II	(24) —
(25) 25	(25) 0.5	(25) WH	(25) 4978	(25) AUTOSAR CAN Bus [-] 2 Serial Data	(25) II	(25) —
26 - 27	—	—	—	Not Occupied	—	—
(28) 28	(28) 0.5	(28) GN / BN	(28) 507	(28) Wait To Start Indicator Control	(28) II	(28) —
29 - 30	—	—	—	Not Occupied	—	—
(31) 31	(31) 0.5	(31) BK / BU	(31) 1271	(31) Accelerator Pedal Position Low Reference 1	(31) II	(31) —
32	—	—	—	Not Occupied	—	—
(33) 33	(33) 0.5	(33) BK / GY	(33) 626	(33) Engine Control Vehicle Sensors Low Reference 1	(33) II	(33) —
(34) 34	(34) 0.5	(34) BK / VT	(34) 1272	(34) Accelerator Pedal Position Low Reference 2	(34) II	(34) —
35	—	—	—	Not Occupied	—	—
(36) 36	(36) 0.5	(36) WH	(36) 4055	(36) Private Serial Data Powertrain CAN Bus [+] Serial Data	(36) II	(36) —
(37) 37	(37) 0.5	(37) BU / BK	(37) 4977	(37) AUTOSAR CAN Bus [+] 3 Serial Data	(37) II	(37) —
(38) 38	(38) 0.5	(38) BU / YE	(38) 4979	(38) AUTOSAR CAN Bus [+] 2 Serial Data	(38) II	(38) —
(39) 39	(39) 0.5	(39) BN	(39) 25	(39) Charge Indicator Control	(39) II	(39) —
40	—	—	—	Not Occupied	—	—
(41) 41	(41) 0.5	(41) BU / VT	(41) 2364	(41) Cooling Fan Speed Signal	(41) II	(41) —
42 - 43	—	—	—	Not Occupied	—	—
(44) 44	(44) 0.5	(44) BU / GY	(44) 636	(44) Ambient Air Temperature Sensor Signal	(44) II	(44) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(45) 45	(45) 0.5	(45) WH / GN	(45) 5380	(45) Brake Position Sensor Signal	(45) II	(45) —
(46) 46	(46) 0.5	(46) YE	(46) 4063	(46) Hood Status A Signal	(46) II	(46) —
(47) 47	(47) 0.5	(47) GN	(47) 380	(47) Air Conditioning Refrigerant Pressure Sensor Signal	(47) II	(47) —
48 - 51	—	—	—	Not Occupied	—	—
(52) 52	(52) 0.5	(52) YE / BK	(52) 625	(52) Starter Enable Relay Control	(52) II	(52) —
53	—	—	—	Not Occupied	—	—
(54) 54	(54) 0.5	(54) GN / YE	(54) 3337	(54) Transmission Internal Mode Switch Mode Control Y	(54) II	(54) —
(55) 55	(55) 0.5	(55) GY	(55) 23	(55) Generator Field Duty Cycle Signal	(55) II	(55) —
(56) 56	(56) 0.5	(56) BU	(56) 492	(56) Mass Air Flow Sensor Signal	(56) II	(56) —
57 - 61	—	—	—	Not Occupied	—	—
(62) 62	(62) 0.5	(62) GN / VT	(62) 4621	(62) Engine Control Module LIN Bus 1	(62) II	(62) —
(63) 63	(63) 0.5	(63) GN / WH	(63) 4622	(63) Engine Control Module LIN Bus 2	(63) II	(63) —
64 - 66	—	—	—	Not Occupied	—	—
(67) 67	(67) 0.5 (67) 0.5	(67) BK (67) WH / GN	(67) 163 (67) 6142	(67) Folding Top Motor Down Control (67) Power Take-Off Engine Shutdown Signal	(67) II (67) II	(67) — (67) —
68 - 72	—	—	—	Not Occupied	—	—
(73) 73	(73) 0.5	(73) BU	(73) 10290	(73) Exhaust Gas Temperature Sensor SENT 2 Signal	(73) II	(73) —
(74) 74	(74) 0.5	(74) YE	(74) 10291	(74) Exhaust Gas Temperature Sensor SENT 3 Signal	(74) II	(74) —
75 - 76	—	—	—	Not Occupied	—	—
(77) 77	(77) 0.5	(77) WH / BN	(77) 2363	(77) Exhaust Pressure Sensor SENT 1 Signal	(77) II	(77) —
(78) 78	(78) 0.5	(78) WH / RD	(78) 480	(78) Engine Control Vehicle Sensors 5 Volt Reference 1	(78) II	(78) —
(79) 79	(79) 0.5	(79) YE / RD	(79) 10595	(79) Engine Control Vehicle Sensors 5 Volt Reference 2	(79) II	(79) —
80 - 91	—	—	—	Not Occupied	—	—
(92) 92	(92) 2.5	(92) VT / BU	(92) 5294	(92) Powertrain Main Relay Fused Supply Voltage 5	(92) I	(92) —
(93) 93	(93) 2.5	(93) VT / BU	(93) 5290	(93) Powertrain Main Relay Fused Supply Voltage 1	(93) I	(93) —

K20 Engine Control Module X1 (L8T)



5663663

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 216744-0003
- Service Connector: 85669159
- Description: 49-Way F 0.64, 2.8 Series, Sealed(BK with BU Terminal Position Assurance)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13587518	J-35616-35 (VT)	J-38125-11A
II	19351723	J-35616-64B (L-BU)	J-38125-213

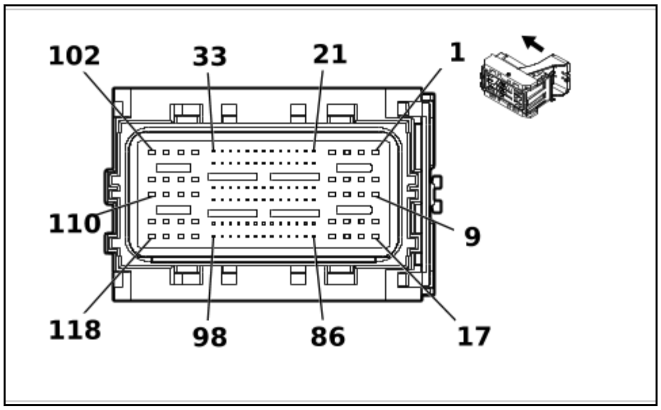
K20 Engine Control Module X1 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU	(1) 492	(1) Mass Air Flow Sensor Signal	(1) II	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) BU / GY	(3) 4054	(3) Private Serial Data Powertrain CAN Bus [-] Serial Data	(3) II	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) WH	(5) 4976	(5) AUTOSAR CAN Bus [-] 3 Serial Data	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) WH	(7) 4978	(7) AUTOSAR CAN Bus [-] 2 Serial Data	(7) II	(7) —
8	—	—	—	Not Occupied	—	—
(9) 9	(9) 0.5	(9) YE	(9) 5991	(9) Powertrain Relay Coil Control	(9) II	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.5	(11) YE	(11) 4063	(11) Hood Status A Signal	(11) II	(11) —
(12) 12	(12) 0.5	(12) BU / GY	(12) 636	(12) Ambient Air Temperature Sensor Signal	(12) II	(12) —
(13) 13	(13) 0.5	(13) WH	(13) 4055	(13) Private Serial Data Powertrain CAN Bus [+] Serial Data	(13) II	(13) —
(14) 14	(14) 0.5	(14) WH / GN	(14) 5380	(14) Brake Position Sensor Signal	(14) II	(14) —
(15) 15	(15) 0.5	(15) BU / BK	(15) 4977	(15) AUTOSAR CAN Bus [+] 3 Serial Data	(15) II	(15) —
16	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(17) 17	(17) 0.5	(17) BU / YE	(17) 4979	(17) AUTOSAR CAN Bus [+] 2 Serial Data	(17) II	(17) —
(18) 18	(18) 0.5	(18) WH / GY	(18) 459	(18) Air Conditioning Compressor Clutch Relay Control	(18) II	(18) —
19 - 20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.5	(21) GN / BU	(21) 428	(21) EVAP Canister Purge Solenoid Control	(21) II	(21) —
(22) 22	(22) 0.5	(22) BU / GN	(22) 11437	(22) Secondary Fuel Pump Disable Signal	(22) II	(22) —
23	—	—	—	Not Occupied	—	—
(24) 24	(24) 0.5	(24) BK / BU	(24) 1271	(24) Accelerator Pedal Position Low Reference 1	(24) II	(24) —
25 - 26	—	—	—	Not Occupied	—	—
(27) 27	(27) 0.5	(27) GN / YE	(27) 3337	(27) Transmission Internal Mode Switch Mode Control Y	(27) II	(27) —
(28) 28	(28) 0.5	(28) BN / GN	(28) 1174	(28) Oil Level Switch Signal	(28) II	(28) —
29	—	—	—	Not Occupied	—	—
(30) 30	(30) 0.5	(30) BK / VT	(30) 1272	(30) Accelerator Pedal Position Low Reference 2	(30) II	(30) —
31	—	—	—	Not Occupied	—	—
(32) 32	(32) 0.75	(32) VT / BU	(32) 5291	(32) Powertrain Main Relay Fused Supply Voltage 2	(32) II	(32) —
33	—	—	—	Not Occupied	—	—
(34) 34	(34) 0.5	(34) RD / BN	(34) 440	(34) Battery Positive Voltage	(34) II	(34) —
35	—	—	—	Not Occupied	—	—
(36) 36	(36) 0.5	(36) YE / BK	(36) 625	(36) Starter Enable Relay Control	(36) II	(36) —
(37) 37	(37) 0.5	(37) GN / GY	(37) 465	(37) Fuel Pump Primary Relay Control	(37) II	(37) —
(38) 38	(38) 0.5	(38) WH / RD	(38) 1164	(38) Accelerator Pedal Position 5V Reference 1	(38) II	(38) —
(39) 39	(39) 0.5	(39) YE / WH	(39) 1161	(39) Accelerator Pedal Position Signal 1	(39) II	(39) —
(40) 40	(40) 0.5	(40) YE / BN	(40) 331	(40) Oil Pressure Sensor Signal	(40) II	(40) —
(41) 41	(41) 0.5	(41) GN	(41) 380	(41) Air Conditioning Refrigerant Pressure Sensor Signal	(41) II	(41) —
(42) 42	(42) 0.5	(42) YE / GY	(42) 11029	(42) Canister Vapor Pressure Sensor Signal	(42) II	(42) —
43	—	—	—	Not Occupied	—	—
(44) 44	(44) 0.5	(44) GN / WH	(44) 1162	(44) Accelerator Pedal Position Signal 2	(44) II	(44) —
(45) 45	(45) 0.5	(45) BN / RD	(45) 1274	(45) Accelerator Pedal Position 5V Reference 2	(45) II	(45) —
46	—	—	—	Not Occupied	—	—
(47) 47	(47) 0.5	(47) VT / GN	(47) 439	(47) Run/Crank Ignition 1 Voltage	(47) II	(47) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(48) 48	(48) 0.75	(48) VT / BU	(48) 5290	(48) Powertrain Main Relay Fused Supply Voltage 1	(48) II	(48) —
(49) 49	(49) 2.5	(49) VT / BU	(49) 5290	(49) Powertrain Main Relay Fused Supply Voltage 1	(49) I	(49) —

K20 Engine Control Module X2 (L5P)



6166536

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13552796
- Service Connector: 85079959
- Description: 118-Way F 0.5, 1.2 MXGENV Series, Sealed(BK with BK Terminal Position Assurance)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85079962	EL-35616-58 (BK)	EL-38125-58
II	85079963	J-35616-16 (L-GN)	EL-38125-58

K20 Engine Control Module X2 (L5P)

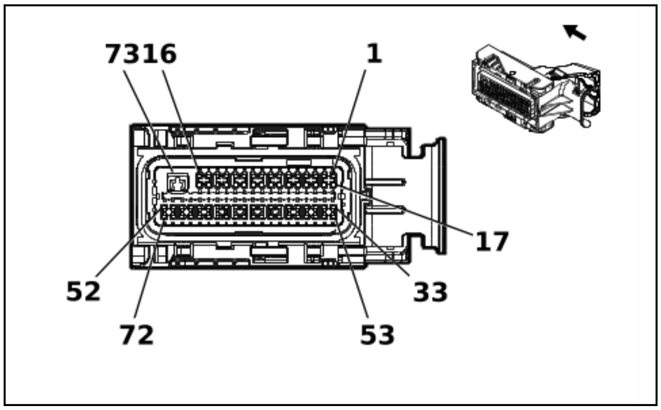
Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / WH	(1) 4901	(1) Direct Fuel Injector High Voltage Supply Cylinder 1	(1) II	(1) —
(2) 2	(2) 0.75	(2) BU / WH	(2) 4904	(2) Direct Fuel Injector High Voltage Supply Cylinder 4	(2) II	(2) —
(3) 3	(3) 0.75	(3) BU / GY	(3) 4902	(3) Direct Fuel Injector High Voltage Supply Cylinder 2	(3) II	(3) —
(4) 4	(4) 0.75	(4) GN / WH	(4) 4905	(4) Direct Fuel Injector High Voltage Supply Cylinder 5	(4) II	(4) —
(5) 5	(5) 0.5	(5) YE	(5) 581	(5) Throttle Actuator Open Control	(5) II	(5) —
(6) 6	(6) 0.5	(6) WH / VT	(6) 5764	(6) Exhaust Gas Recirculation Valve High Control	(6) II	(6) —
(7) 7	(7) 0.5	(7) VT / BK	(7) 5746	(7) Exhaust Gas Recirculation Valve Low Control	(7) II	(7) —
(8) 8	(8) 0.5	(8) BK / BU	(8) 10597	(8) Engine Control Sensors Low Reference 3	(8) II	(8) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(9) 9	(9) 0.5	(9) BN / WH	(9) 582	(9) Throttle Actuator Close Control	(9) II	(9) —
(10) 10	(10) 0.5	(10) BN / VT	(10) 3656	(10) EGR Cooler Bypass Valve Close Control	(10) II	(10) —
(11) 11	(11) 0.5	(11) YE / GN	(11) 3655	(11) EGR Cooler Bypass Valve Open Control	(11) II	(11) —
12	—	—	—	Not Occupied	—	—
(13) 13	(13) 0.5	(13) BU / WH	(13) 2530	(13) Fuel Rail Pressure Solenoid Valve Control	(13) II	(13) —
14 - 16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.5	(17) YE	(17) 2928	(17) Fuel Metering Solenoid Valve High Control	(17) II	(17) —
18 - 20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.5	(21) GN	(21) 10289	(21) Exhaust Gas Temperature Sensor SENT 1 Signal	(21) I	(21) —
(22) 22	(22) 0.5	(22) BU / WH	(22) 3630	(22) Throttle Position Sensor SENT 1 Signal	(22) I	(22) —
23 - 25	—	—	—	Not Occupied	—	—
(26) 26	(26) 0.5	(26) GN / WH	(26) 432	(26) Manifold Absolute Pressure Sensor Signal	(26) I	(26) —
(27) 27	(27) 0.5	(27) YE / BN	(27) 331	(27) Oil Pressure Sensor Signal	(27) I	(27) —
(28) 28	(28) 0.5	(28) WH / BU	(28) 7329	(28) Pre-Throttle Air Temperature Signal	(28) I	(28) —
(29) 29	(29) 0.5	(29) BU	(29) 410	(29) Engine Coolant Temperature Sensor Signal	(29) I	(29) —
(30) 30	(30) 0.5	(30) BN	(30) 3681	(30) Charge Air Cooler Outlet Temperature Sensor Signal	(30) I	(30) —
(31) 31	(31) 0.5	(31) GN	(31) 3683	(31) Charge Air Cooler Inlet Temperature Sensor Signal	(31) I	(31) —
32 - 38	—	—	—	Not Occupied	—	—
(39) 39	(39) 0.5	(39) BU / WH	(39) 2918	(39) Fuel Rail Pressure Sensor Signal	(39) I	(39) —
(40) 40	(40) 0.5	(40) BN / WH	(40) 5763	(40) Exhaust Gas Recirculation Position Signal	(40) I	(40) —
(41) 41	(41) 0.5	(41) GN / GY	(41) 3654	(41) EGR Cooler Bypass Valve Position Sensor Signal	(41) I	(41) —
42 - 46	—	—	—	Not Occupied	—	—
(47) 47	(47) 0.5	(47) YE / GY	(47) 3926	(47) Crankcase Differential Pressure Sensor Signal	(47) I	(47) —
48 - 59	—	—	—	Not Occupied	—	—
(60) 60	(60) 0.5	(60) BN / GN	(60) 1174	(60) Oil Level Switch Signal	(60) I	(60) —
61 - 63	—	—	—	Not Occupied	—	—
(64) 64	(64) 0.5	(64) BK / GN	(64) 2919	(64) Fuel Rail Pressure Sensor Low Reference	(64) I	(64) —
65 - 76	—	—	—	Not Occupied	—	—
(77) 77	(77) 0.5	(77) BN / YE	(77) 2161	(77) Fuel Rail Pressure Sensor 2 Signal	(77) I	(77) —
(78) 78	(78) 0.5	(78) BK / YE	(78) 6275	(78) Exhaust Gas Recirculation Temperature Sensor 2 Low Reference	(78) I	(78) —
79 - 82	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(83) 83	(83) 0.5	(83) BK / GY	(83) 5296	(83) Exhaust Camshaft Position Sensor Low Reference 1	(83) I	(83) —
(84) 84	(84) 0.5	(84) GN	(84) 6271	(84) Crankshaft Position Sensor Signal	(84) I	(84) —
(85) 85	(85) 0.5	(85) BK / VT	(85) 6272	(85) Crankshaft Position Sensor Low Reference	(85) I	(85) —
86 - 89	—	—	—	Not Occupied	—	—
(90) 90	(90) 0.5	(90) BN / RD	(90) 2917	(90) Fuel Rail Pressure Sensor 5V Reference	(90) I	(90) —
(91) 91	(91) 0.5	(91) YE / GN	(91) 3236	(91) Exhaust Gas Recirculation Temperature Sensor 2 Signal	(91) I	(91) —
92 - 95	—	—	—	Not Occupied	—	—
(96) 96	(96) 0.5	(96) VT / BU	(96) 6270	(96) Crankshaft Position Sensor Voltage	(96) I	(96) —
(97) 97	(97) 0.5	(97) VT / BK	(97) 5273	(97) Exhaust Camshaft Position Sensor 1	(97) I	(97) —
(98) 98	(98) 0.5	(98) GY / YE	(98) 5297	(98) Exhaust Camshaft Position Sensor 1 Voltage Reference	(98) I	(98) —
(99) 99	(99) 0.75	(99) WH / YE	(99) 4907	(99) Direct Fuel Injector High Voltage Supply Cylinder 7	(99) II	(99) —
(100) 100	(100) 0.75	(100) VT / GY	(100) 4906	(100) Direct Fuel Injector High Voltage Supply Cylinder 6	(100) II	(100) —
(101) 101	(101) 0.75 (101) 0.5	(101) GY / WH (101) GY / BU	(101) 4908 (101) 4908	(101) Direct Fuel Injector High Voltage Supply Cylinder 8 (101) Direct Fuel Injector High Voltage Supply Cylinder 8	(101) II (101) II	(101) 1ST_DESIGN (101) 2ND_DESIGN
(102) 102	(102) 0.75	(102) GN / GY	(102) 4903	(102) Direct Fuel Injector High Voltage Supply Cylinder 3	(102) II	(102) —
(103) 103	(103) 0.75	(103) BN	(103) 4801	(103) Direct Fuel Injector High Voltage Control Cylinder 1	(103) II	(103) —
(104) 104	(104) 0.75	(104) GY / BU	(104) 4804	(104) Direct Fuel Injector High Voltage Control Cylinder 4	(104) II	(104) —
(105) 105	(105) 0.75	(105) BU	(105) 4802	(105) Direct Fuel Injector High Voltage Control Cylinder 2	(105) II	(105) —
(106) 106	(106) 0.75	(106) WH / GN	(106) 4805	(106) Direct Fuel Injector High Voltage Control Cylinder 5	(106) II	(106) —
(107) 107	(107) 0.75	(107) YE / GY	(107) 4807	(107) Direct Fuel Injector High Voltage Control Cylinder 7	(107) II	(107) —
(108) 108	(108) 0.75	(108) VT / GN	(108) 4806	(108) Direct Fuel Injector High Voltage Control Cylinder 6	(108) II	(108) —
(109) 109	(109) 0.75	(109) GY	(109) 4808	(109) Direct Fuel Injector High Voltage Control Cylinder 8	(109) II	(109) —
(110) 110	(110) 0.75	(110) GN	(110) 4803	(110) Direct Fuel Injector High Voltage Control Cylinder 3	(110) II	(110) —
(111) 111	(111) 0.5	(111) BU / RD	(111) 460	(111) Engine Control Sensors 5 Volt Reference 1	(111) II	(111) —
(112) 112	(112) 0.5	(112) BK / YE	(112) 548	(112) Engine Control Sensors Low Reference 1	(112) II	(112) —
113 - 114	—	—	—	Not Occupied	—	—
(115) 115	(115) 0.5	(115) GY / RD	(115) 10667	(115) Engine Control Sensors 5 Volt Reference	(115) II	(115) —
(116) 116	(116) 0.5	(116) BK / GN	(116) 580	(116) Engine Control Sensors Low Reference 2	(116) II	(116) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(117) 117	(117) 0.5	(117) BK / YE	(117) 2834	(117) Fuel Rail Pressure Solenoid Valve Low Control	(117) II	(117) —
(118) 118	(118) 0.5	(118) BN / BK	(118) 2929	(118) Fuel Metering Solenoid Valve Low Control	(118) II	(118) —

K20 Engine Control Module X2 (L8T)



1673472

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 216739-0001
- Service Connector: 85761019
- Description: 73-Way F 0.64, 2.8 MX123 Series, Sealed(BK with BK Terminal Position Assurance)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13587518	J-35616-35 (VT)	J-38125-11A
II	19354746	J-35616-64B (L-BU)	J-38125-213

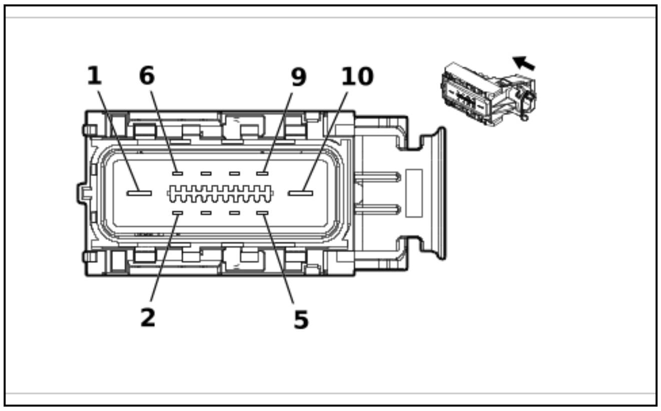
K20 Engine Control Module X2 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / YE	(1) 3212	(1) HO2S Heater Low Control Bank 2 Sensor 1	(1) II	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) BK / YE	(3) 548	(3) Engine Control Sensors Low Reference 1	(3) II	(3) —
4 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) GN / WH	(7) 4622	(7) Engine Control Module LIN Bus 2	(7) II	(7) —
(8) 8	(8) 0.5	(8) GN / VT	(8) 4621	(8) Engine Control Module LIN Bus 1	(8) II	(8) —
9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.5	(10) VT / GY	(10) 3110	(10) HO2S High Signal Bank 1 Sensor 1	(10) II	(10) —
(11) 11	(11) 0.5	(11) WH / BK	(11) 3111	(11) HO2S Low Signal Bank 1 Sensor 1	(11) II	(11) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(12) 12	(12) 0.5	(12) YE / BU	(12) 2124	(12) Ignition Control 4	(12) II	(12) —
(13) 13	(13) 0.5	(13) BN / BU	(13) 2126	(13) Ignition Control 6	(13) II	(13) —
14 - 16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.5	(17) GY / WH	(17) 3113	(17) HO2S Heater Low Control Bank 1 Sensor 1	(17) II	(17) —
18 - 25	—	—	—	Not Occupied	—	—
(26) 26	(26) 0.5	(26) VT / WH	(26) 3210	(26) HO2S High Signal Bank 2 Sensor 1	(26) II	(26) —
(27) 27	(27) 0.5	(27) YE / WH	(27) 3211	(27) HO2S Low Signal Bank 2 Sensor 1	(27) II	(27) —
(28) 28	(28) 0.5	(28) GN / BU	(28) 2123	(28) Ignition Control 3	(28) II	(28) —
(29) 29	(29) 0.5	(29) BU / GY	(29) 2125	(29) Ignition Control 5	(29) II	(29) —
(30) 30	(30) 0.5	(30) BK / GY	(30) 2130	(30) Ignition Control Low Reference Bank 2	(30) II	(30) —
31 - 32	—	—	—	Not Occupied	—	—
(33) 33	(33) 0.5	(33) WH / BN	(33) 3223	(33) HO2S Heater Low Control Bank 2 Sensor 2	(33) II	(33) —
34	—	—	—	Not Occupied	—	—
(35) 35	(35) 0.5	(35) BU	(35) 179	(35) Engine Oil Pump Control	(35) II	(35) —
36	—	—	—	Not Occupied	—	—
(37) 37	(37) 0.5	(37) VT / BU	(37) 5294	(37) Powertrain Main Relay Fused Supply Voltage 5	(37) II	(37) —
38	—	—	—	Not Occupied	—	—
(39) 39	(39) 0.5	(39) WH / RD	(39) 480	(39) Engine Control Vehicle Sensors 5 Volt Reference 1	(39) II	(39) —
40 - 45	—	—	—	Not Occupied	—	—
(46) 46	(46) 0.5	(46) YE / BU	(46) 3221	(46) HO2S Low Signal Bank 2 Sensor 2	(46) II	(46) —
(47) 47	(47) 0.5	(47) VT / GN	(47) 3220	(47) HO2S High Signal Bank 2 Sensor 2	(47) II	(47) —
48 - 49	—	—	—	Not Occupied	—	—
(50) 50	(50) 0.5	(50) BK / GY	(50) 2303	(50) Knock Sensor Low Reference 2	(50) II	(50) —
(51) 51	(51) 0.5	(51) BK / YE	(51) 1716	(51) Knock Sensor Low Reference 1	(51) II	(51) —
(52) 52	(52) 0.5	(52) BN / WH	(52) 582	(52) Throttle Actuator Close Control	(52) II	(52) —
(53) 53	(53) 0.5	(53) GY / WH	(53) 3122	(53) HO2S Heater Low Control Bank 1 Sensor 2	(53) II	(53) —
54 - 65	—	—	—	Not Occupied	—	—
(66) 66	(66) 0.5	(66) WH / YE	(66) 3121	(66) HO2S Low Signal Bank 1 Sensor 2	(66) II	(66) —
(67) 67	(67) 0.5	(67) BN	(67) 3120	(67) HO2S High Signal Bank 1 Sensor 2	(67) II	(67) —
68 - 69	—	—	—	Not Occupied	—	—
(70) 70	(70) 0.5	(70) WH / GY	(70) 1876	(70) Knock Sensor 2 Signal	(70) II	(70) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(71) 71	(71) 0.5	(71) VT / GY	(71) 496	(71) Knock Sensor 1 Signal	(71) II	(71) —
(72) 72	(72) 0.5	(72) YE	(72) 581	(72) Throttle Actuator Open Control	(72) II	(72) —
(73) 73	(73) 2.5	(73) BK / WH	(73) 251	(73) Signal Ground	(73) I	(73) —

K20 Engine Control Module X3 (L5P)



6168487

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 203259-0106
- Service Connector: 85761015
- Description: 10-Way F 2.8, 6.3 APEX Series, Sealed(BK with GY Terminal Position Assurance)

Terminal Part Information

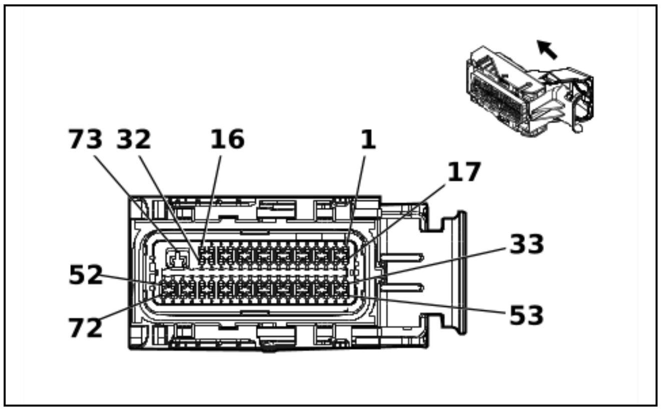
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19355735	J-35616-4A (PU)	J-38125-217
II	85079964	J-35616-42 (RD)	J-38125-217

K20 Engine Control Module X3 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 6	(1) BN / BU	(1) 104	(1) Glow Plug Control	(1) II	(1) —
(2) 2	(2) 2.5	(2) GY / BU	(2) 1581	(2) Glow Plug 1 Control	(2) I	(2) —
(3) 3	(3) 2.5	(3) WH / BK	(3) 1587	(3) Glow Plug 7 Control	(3) I	(3) —
(4) 4	(4) 2.5	(4) GY / YE	(4) 1584	(4) Glow Plug 4 Control	(4) I	(4) —
(5) 5	(5) 2.5	(5) GY / VT	(5) 1586	(5) Glow Plug 6 Control	(5) I	(5) —
(6) 6	(6) 2.5	(6) GY / BN	(6) 1582	(6) Glow Plug 2 Control	(6) I	(6) —
(7) 7	(7) 2.5	(7) WH / BU	(7) 1588	(7) Glow Plug 8 Control	(7) I	(7) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(8) 8	(8) 2.5	(8) GY / WH	(8) 1585	(8) Glow Plug 5 Control	(8) I	(8) —
(9) 9	(9) 2.5	(9) GY / GN	(9) 1583	(9) Glow Plug 3 Control	(9) I	(9) —
(10) 10	(10) 6	(10) BN / BU	(10) 104	(10) Glow Plug Control	(10) II	(10) —

K20 Engine Control Module X3 (L8T)



1650395

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 216739-0002
- Service Connector: 85761016
- Description: 73-Way F 0.64, 2.8 MX123 Series, Sealed(BK with GY Terminal Position Assurance)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13587518	J-35616-35 (VT)	J-38125-11A
II	19354746	J-35616-64B (L-BU)	J-38125-213

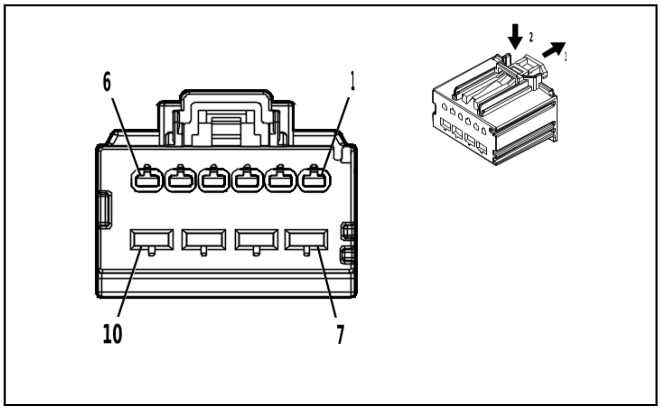
K20 Engine Control Module X3 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) VT / BN	(5) 5284	(5) Intake Camshaft Position Actuator Solenoid Valve 1	(5) II	(5) —
(6) 6	(6) 0.5	(6) VT / GN	(6) 4320	(6) Powertrain Sensor Bus Enable	(6) II	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.5	(8) YE / VT	(8) 5275	(8) Intake Camshaft Position Sensor 1	(8) II	(8) —
(9) 9	(9) 0.5	(9) GY / BU	(9) 5300	(9) Intake Camshaft Position Sensor 1 Voltage Reference	(9) II	(9) —
(10) 10	(10) 0.5	(10) GN	(10) 6271	(10) Crankshaft Position Sensor Signal	(10) II	(10) —
11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.5	(12) BU / WH	(12) 2122	(12) Ignition Control 2	(12) II	(12) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(13) 13	(13) 0.5	(13) VT / WH	(13) 2128	(13) Ignition Control 8	(13) II	(13) —
(14) 14	(14) 0.5	(14) BN	(14) 25	(14) Charge Indicator Control	(14) II	(14) —
15	—	—	—	Not Occupied	—	—
(16) 16	(16) 0.75	(16) YE	(16) 7301	(16) High Pressure Fuel Pump High Control	(16) II	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.5	(18) WH / RD	(18) 11031	(18) Fuel Tank Isolation Valve Supply Voltage	(18) II	(18) —
19 - 20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.5	(21) BK / BN	(21) 6753	(21) Camshaft Position Actuator Solenoid Valve 1 Low Reference	(21) II	(21) —
22 - 23	—	—	—	Not Occupied	—	—
(24) 24	(24) 0.5	(24) BK / GN	(24) 5301	(24) Intake Camshaft Position Sensor Low Reference 1	(24) II	(24) —
(25) 25	(25) 0.5	(25) VT / BU	(25) 6270	(25) Crankshaft Position Sensor Voltage	(25) II	(25) —
(26) 26	(26) 0.5	(26) BK / VT	(26) 6272	(26) Crankshaft Position Sensor Low Reference	(26) II	(26) —
27	—	—	—	Not Occupied	—	—
(28) 28	(28) 0.5	(28) GN / GY	(28) 2127	(28) Ignition Control 7	(28) II	(28) —
(29) 29	(29) 0.5	(29) BU / VT	(29) 2121	(29) Ignition Control 1	(29) II	(29) —
(30) 30	(30) 0.5	(30) BK / BU	(30) 2129	(30) Ignition Control Low Reference Bank 1	(30) II	(30) —
31	—	—	—	Not Occupied	—	—
(32) 32	(32) 0.75	(32) VT / BK	(32) 7300	(32) High Pressure Fuel Pump Low Control	(32) II	(32) —
33 - 35	—	—	—	Not Occupied	—	—
(36) 36	(36) 0.5	(36) BK / BN	(36) 2752	(36) Throttle Position Sensor Low Reference	(36) II	(36) —
(37) 37	(37) 0.5	(37) BK / GN	(37) 469	(37) Manifold Absolute Pressure Sensor Low Reference	(37) II	(37) —
38 - 39	—	—	—	Not Occupied	—	—
(40) 40	(40) 0.5	(40) BN / BU	(40) 357	(40) Oil Temperature Sensor Signal	(40) II	(40) —
41 - 42	—	—	—	Not Occupied	—	—
(43) 43	(43) 0.5	(43) BK / GY	(43) 626	(43) Engine Control Vehicle Sensors Low Reference 1	(43) II	(43) —
(44) 44	(44) 0.75	(44) VT / BU	(44) 5292	(44) Powertrain Main Relay Fused Supply Voltage 3	(44) II	(44) —
(45) 45	(45) 0.75	(45) GN	(45) 4803	(45) Direct Fuel Injector High Voltage Control Cylinder 3	(45) II	(45) —
(46) 46	(46) 0.75	(46) GY / BU	(46) 4804	(46) Direct Fuel Injector High Voltage Control Cylinder 4	(46) II	(46) —
(47) 47	(47) 0.75	(47) WH / GN	(47) 4805	(47) Direct Fuel Injector High Voltage Control Cylinder 5	(47) II	(47) —
(48) 48	(48) 0.75	(48) VT / GN	(48) 4806	(48) Direct Fuel Injector High Voltage Control Cylinder 6	(48) II	(48) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(49) 49	(49) 0.75	(49) BU	(49) 4802	(49) Direct Fuel Injector High Voltage Control Cylinder 2	(49) II	(49) —
(50) 50	(50) 0.75	(50) YE / GY	(50) 4807	(50) Direct Fuel Injector High Voltage Control Cylinder 7	(50) II	(50) —
(51) 51	(51) 0.75	(51) GY	(51) 4808	(51) Direct Fuel Injector High Voltage Control Cylinder 8	(51) II	(51) —
(52) 52	(52) 0.75	(52) BN	(52) 4801	(52) Direct Fuel Injector High Voltage Control Cylinder 1	(52) II	(52) —
53 - 54	—	—	—	Not Occupied	—	—
(55) 55	(55) 0.5	(55) BN / RD	(55) 2701	(55) Throttle Position Sensor 5V Reference	(55) II	(55) —
(56) 56	(56) 0.5	(56) BU / WH	(56) 3630	(56) Throttle Position Sensor SENT 1 Signal	(56) II	(56) —
(57) 57	(57) 0.5	(57) GY / RD	(57) 2704	(57) Manifold Absolute Pressure Sensor 5V Reference	(57) II	(57) —
(58) 58	(58) 0.5	(58) GN / WH	(58) 432	(58) Manifold Absolute Pressure Sensor Signal	(58) II	(58) —
59 - 60	—	—	—	Not Occupied	—	—
(61) 61	(61) 0.5	(61) BU	(61) 410	(61) Engine Coolant Temperature Sensor Signal	(61) II	(61) —
62	—	—	—	Not Occupied	—	—
(63) 63	(63) 0.5	(63) BU / WH	(63) 10786	(63) Fuel Rail Pressure Sensor SENT 1 Signal	(63) II	(63) —
(64) 64	(64) 0.5	(64) GY	(64) 23	(64) Generator Field Duty Cycle Signal	(64) II	(64) —
(65) 65	(65) 0.75	(65) GN / GY	(65) 4903	(65) Direct Fuel Injector High Voltage Supply Cylinder 3	(65) II	(65) —
(66) 66	(66) 0.75	(66) BU / WH	(66) 4904	(66) Direct Fuel Injector High Voltage Supply Cylinder 4	(66) II	(66) —
(67) 67	(67) 0.75	(67) GN / WH	(67) 4905	(67) Direct Fuel Injector High Voltage Supply Cylinder 5	(67) II	(67) —
(68) 68	(68) 0.75	(68) VT / GY	(68) 4906	(68) Direct Fuel Injector High Voltage Supply Cylinder 6	(68) II	(68) —
(69) 69	(69) 0.75	(69) BU / GY	(69) 4902	(69) Direct Fuel Injector High Voltage Supply Cylinder 2	(69) II	(69) —
(70) 70	(70) 0.75	(70) WH / YE	(70) 4907	(70) Direct Fuel Injector High Voltage Supply Cylinder 7	(70) II	(70) —
(71) 71	(71) 0.75	(71) GY / WH	(71) 4908	(71) Direct Fuel Injector High Voltage Supply Cylinder 8	(71) II	(71) —
(72) 72	(72) 0.75	(72) BN / WH	(72) 4901	(72) Direct Fuel Injector High Voltage Supply Cylinder 1	(72) II	(72) —
(73) 73	(73) 2.5	(73) BK / WH	(73) 251	(73) Signal Ground	(73) I	(73) —

K29FV Front Seat Heater Vent Control Module X1 (KA1)



5035058

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 31372-1600
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 1.5, 2.8 MX Series(BK)

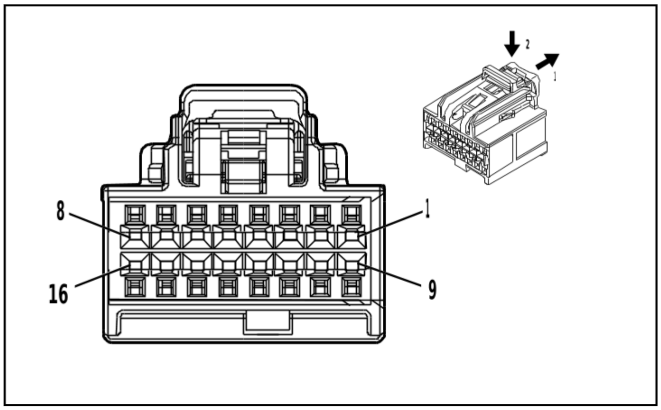
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

K29FV Front Seat Heater Vent Control Module X1 (KA1)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) WH / BN	(1) 2481	(1) Passenger Seat Back Heating Element Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) BN / BU	(2) 2479	(2) Passenger Seat Heating Element Control	(2) I	(2) —
(3) 3	(3) 0.75	(3) GY / BK	(3) 2480	(3) Passenger Seat Heating Element Low Reference	(3) I	(3) —
(4) 4	(4) 0.75	(4) BN / BK	(4) 2078	(4) Driver Seat Heating Element Low Reference	(4) I	(4) —
(5) 5	(5) 0.75	(5) BN	(5) 2432	(5) Driver Seat Back Heating Element Control	(5) I	(5) —
(6) 6	(6) 0.75	(6) BN / VT	(6) 2077	(6) Driver Seat Heating Element Control	(6) I	(6) —
(7) 7	(7) 0.75	(7) RD / GN	(7) 6140	(7) Battery Positive Voltage	(7) II	(7) —
(8) 8	(8) 0.75	(8) BK	(8) 1350	(8) Ground	(8) II	(8) —
9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.75	(10) RD / BN	(10) 6640	(10) Battery Positive Voltage	(10) II	(10) —

K29FV Front Seat Heater Vent Control Module X2 (KA1)



4873243

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 35016343
- Service Connector: Service by Harness - See Part Catalog
- Description: 16-Way F 0.64 OCS Series(BK)

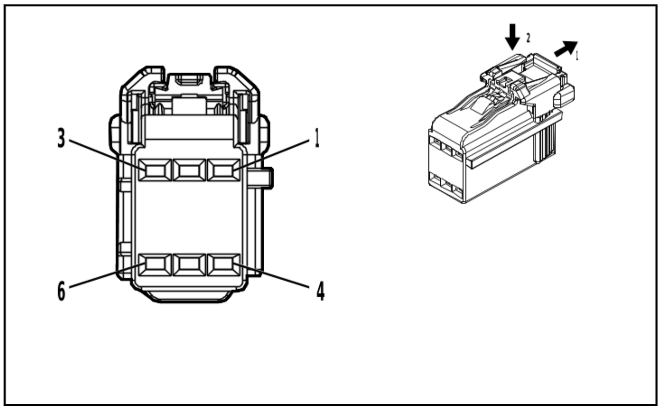
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

K29FV Front Seat Heater Vent Control Module X2 (KA1)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / YE	(1) 2080	(1) Driver Heated Seat Thermistor Low Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 2435	(2) Passenger Heated Seat Thermistor Low Reference	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU	(3) 2425	(3) Driver Seat Back Heating Temperature Sensor Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH / BU	(4) 2436	(4) Passenger Seat Back Heating Temperature Sensor Signal	(4) I	(4) —
(5) 5	(5) 0.5	(5) WH / GY	(5) 2434	(5) Passenger Seat Heating Temperature Sensor Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) YE / GY	(6) 2079	(6) Driver Seat Heating Temperature Sensor Signal	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.5	(8) GN / VT	(8) 2857	(8) Body Control Module LIN Bus 11	(8) I	(8) —
(9) 9	(9) 0.5	(9) GN / VT	(9) 5906	(9) Driver Seat Blower Motor Control 1	(9) I	(9) —
(10) 10	(10) 0.5	(10) VT / WH	(10) 5908	(10) Passenger Seat Blower Motor Control 1	(10) I	(10) —
11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.5	(12) BK / GN	(12) 2482	(12) Passenger Heated Back Thermistor Low Reference	(12) I	(12) —
13 - 16	—	—	—	Not Occupied	—	—

K32 Heated Steering Wheel Module X1 (KI3)



4862126

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 6098-8996
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 1.2 Series(BK)

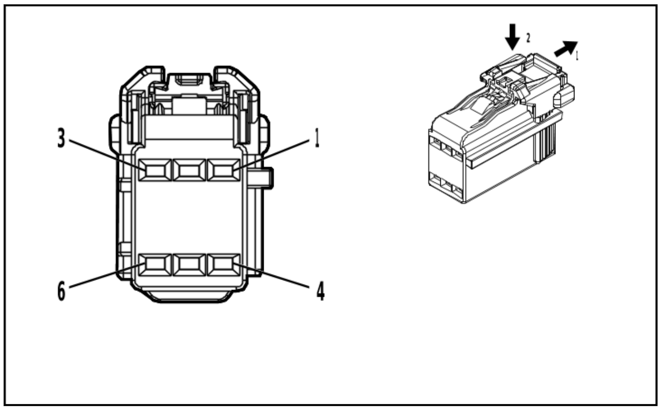
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

K32 Heated Steering Wheel Module X1 (KI3)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN	(1) 5883	(1) Steering Wheel Heating Switch Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) GY / OG	(2) 5884	(2) Steering Wheel Heating Switch LED Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) OG	(3) 40	(3) Battery Positive Voltage	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK	(4) 50	(4) Ground	(4) I	(4) —
(5) 5	(5) 0.35	(5) BK	(5) 51	(5) Signal Ground	(5) I	(5) —
(6) 6	(6) 0.35	(6) WH	(6) 2858	(6) Body Control Module LIN Bus 12	(6) I	(6) —

K32 Heated Steering Wheel Module X1 (KI3 & N57 & D07)



4862126

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 13532426
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 1.2 Series(BK)

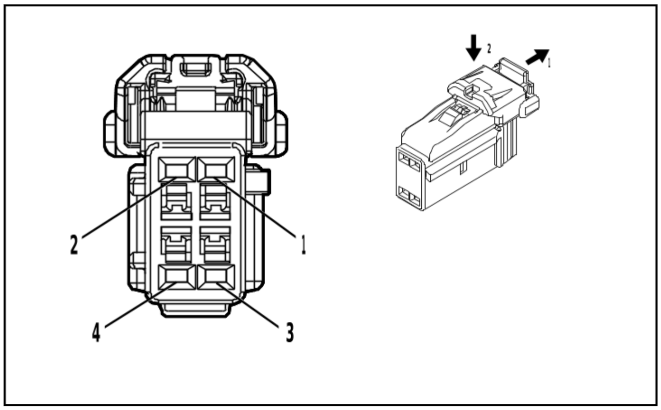
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

K32 Heated Steering Wheel Module X1 (KI3 & N57 & D07)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN	(1) 5883	(1) Steering Wheel Heating Switch Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) GY / OG	(2) 5884	(2) Steering Wheel Heating Switch LED Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) OG	(3) 10040	(3) Battery Positive Voltage	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK	(4) 6050	(4) Steering Wheel Ground	(4) I	(4) —
(5) 5	(5) 0.35	(5) BK	(5) 6051	(5) Steering Wheel Ground	(5) I	(5) —
(6) 6	(6) 0.35	(6) WH	(6) 2858	(6) Body Control Module LIN Bus 12	(6) I	(6) —

K32 Heated Steering Wheel Module X2 (KI3-UKL)



4872683

Connector Part Information

- Harness Type: Steering Wheel Heater
- OEM Connector: 13533335
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 1.2 Series(BK)

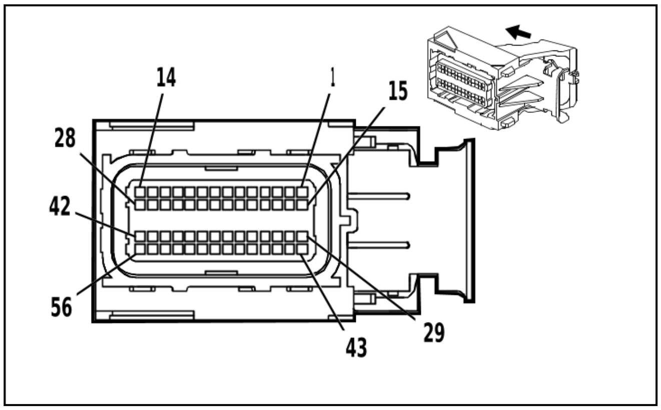
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K32 Heated Steering Wheel Module X2 (KI3-UKL)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) WH / YE	(1) 5888	(1) Steering Wheel Heating High Control	(1) I	(1) —
(2) 2	(2) —	(2) GY / YE	(2) 5887	(2) Steering Wheel Heating Low Control	(2) I	(2) —
(3) 3	(3) —	(3) VT / BU	(3) 5886	(3) Steering Wheel Heating Temperature Sensor Signal	(3) I	(3) —
(4) 4	(4) —	(4) YE / RD	(4) 5885	(4) Steering Wheel Heating Voltage Reference	(4) I	(4) —

K36 Restraints Control Module X1



1590948

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 12728284
- Service Connector: 85090371
- Description: 56-Way F 0.64 MX123 Series, Sealed(BK with BU Terminal Position Assurance)

Terminal Part Information

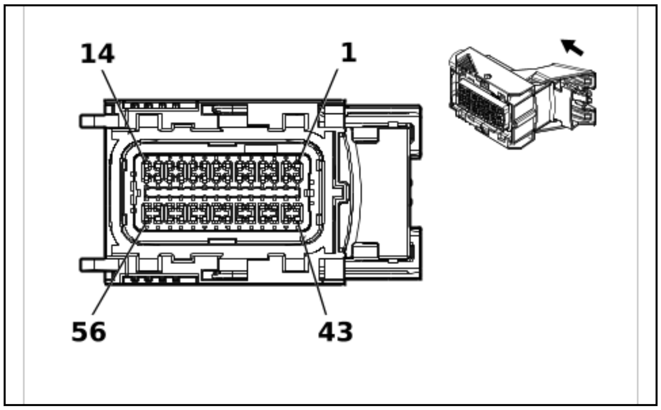
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19354746	J-35616-64B (L-BU)	J-38125-213

K36 Restraints Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) BK / OG	(7) 5045	(7) Left Front Impact Discriminating Sensor Low Reference	(7) I	(7) —
(8) 8	(8) 0.5	(8) OG / YE	(8) 354	(8) Left Front Impact Discriminating Sensor Signal	(8) I	(8) —
(9) 9	(9) 0.5	(9) OG / GN	(9) 1409	(9) Right Front Impact Discriminating Sensor Signal	(9) I	(9) —
(10) 10	(10) 0.5	(10) BK / OG	(10) 5600	(10) Right Front Impact Discriminating Sensor Low Reference	(10) I	(10) —
(11) 11	(11) 0.5	(11) WH / OG	(11) 3476	(11) Passenger Seat Belt Retractor Pretensioner Low Control	(11) I	(11) —
(12) 12	(12) 0.5	(12) OG / GN	(12) 3475	(12) Passenger Seat Belt Retractor Pretensioner High Control	(12) I	(12) —
(13) 13	(13) 0.35	(13) YE / OG	(13) 3025	(13) Passenger Instrument Panel Air Bag Stage 1 High Control	(13) I	(13) —
(14) 14	(14) 0.35	(14) OG / WH	(14) 3024	(14) Passenger Instrument Panel Air Bag Stage 1 Low Control	(14) I	(14) —
15 - 24	—	—	—	Not Occupied	—	—
(25) 25	(25) 0.5	(25) VT / OG	(25) 3478	(25) Driver Seat Belt Retractor Pretensioner Low Control	(25) I	(25) —
(26) 26	(26) 0.5	(26) OG / WH	(26) 3477	(26) Driver Seat Belt Retractor Pretensioner High Control	(26) I	(26) —
(27) 27	(27) 0.35	(27) OG / VT	(27) 3021	(27) Steering Wheel Air Bag Stage 1 High Control	(27) I	(27) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(28) 28	(28) 0.35	(28) BN / OG	(28) 3020	(28) Steering Wheel Air Bag Stage 1 Low Control	(28) I	(28) —
(29) 29	(29) 0.5	(29) BU	(29) 4987	(29) AUTOSAR CAN Bus [+] 1 Serial Data	(29) I	(29) —
(30) 30	(30) 0.5	(30) WH	(30) 4986	(30) AUTOSAR CAN Bus [-] 1 Serial Data	(30) I	(30) —
31	—	—	—	Not Occupied	—	—
(32) 32	(32) 0.5	(32) OG / BN	(32) 3479	(32) Passenger Seat Belt Anchor Pretensioner High Control	(32) I	(32) —
(33) 33	(33) 0.5	(33) GY / OG	(33) 3480	(33) Passenger Seat Belt Anchor Pretensioner Low Control	(33) I	(33) —
34 - 37	—	—	—	Not Occupied	—	—
(38) 38	(38) 0.35	(38) OG / VT	(38) 3026	(38) Passenger Instrument Panel Air Bag Stage 2 Low Control	(38) I	(38) —
(39) 39	(39) 0.35	(39) GY / OG	(39) 3027	(39) Passenger Instrument Panel Air Bag Stage 2 High Control	(39) I	(39) —
40 - 41	—	—	—	Not Occupied	—	—
(42) 42	(42) 0.5	(42) BK / WH	(42) 1251	(42) Signal Ground	(42) I	(42) —
(43) 43	(43) 0.5	(43) BU	(43) 4987	(43) AUTOSAR CAN Bus [+] 1 Serial Data	(43) I	(43) —
(44) 44	(44) 0.5	(44) WH	(44) 4986	(44) AUTOSAR CAN Bus [-] 1 Serial Data	(44) I	(44) —
45	—	—	—	Not Occupied	—	—
(46) 46	(46) 0.5	(46) VT / OG	(46) 3482	(46) Driver Seat Belt Anchor Pretensioner Low Control	(46) I	(46) —
(47) 47	(47) 0.5	(47) OG / YE	(47) 3481	(47) Driver Seat Belt Anchor Pretensioner High Control	(47) I	(47) —
48 - 49	—	—	—	Not Occupied	—	—
(50) 50	(50) 0.35	(50) BN / WH	(50) 3895	(50) Roof Rail Air Bag Disable Switch Low Reference	(50) I	(50) —
(51) 51	(51) 0.35	(51) BU / WH	(51) 3119	(51) Roof Rail Air Bag Disable Switch Signal	(51) I	(51) —
52	—	—	—	Not Occupied	—	—
(53) 53	(53) 0.35	(53) WH / OG	(53) 3022	(53) Steering Wheel Air Bag Stage 2 Low Control	(53) I	(53) —
(54) 54	(54) 0.35	(54) OG / GN	(54) 3023	(54) Steering Wheel Air Bag Stage 2 High Control	(54) I	(54) —
(55) 55	(55) 0.35	(55) VT / WH	(55) 239	(55) Run/Crank Ignition 1 Voltage	(55) I	(55) —
(56) 56	(56) 0.5	(56) RD / GN	(56) 4440	(56) Battery Positive Voltage	(56) I	(56) —

K36 Restraints Control Module X2



5377124

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 12728285
- Service Connector: 85004498
- Description: 56-Way F 0.64 MX123 Series, Sealed(BK)

Terminal Part Information

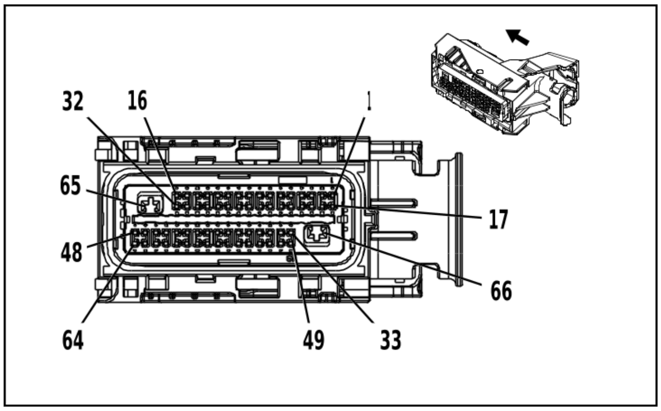
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19354746	J-35616-64B (L-BU)	J-38125-213

K36 Restraints Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.5	(10) BU / OG	(10) 5163	(10) Rear Center Seat Belt Switch Signal	(10) I	(10) —
(11) 11	(11) 0.5	(11) YE / OG	(11) 5161	(11) Left Rear Seat Belt Switch Signal	(11) I	(11) —
(12) 12	(12) 0.35	(12) OG / BN	(12) 238	(12) Driver Seat Belt Switch Signal	(12) I	(12) —
(13) 13	(13) 0.5	(13) BK / OG	(13) 6627	(13) Right Rear Side Impact Sensor Low Reference	(13) I	(13) —
(14) 14	(14) 0.5	(14) OG / WH	(14) 6626	(14) Right Rear Side Impact Sensor Signal	(14) I	(14) —
15 - 22	—	—	—	Not Occupied	—	—
(23) 23	(23) 0.5	(23) BK / OG	(23) 1363	(23) Driver Seat Belt Switch Low Reference	(23) I	(23) —
(24) 24	(24) 0.5	(24) BN / OG	(24) 5162	(24) Right Rear Seat Belt Switch Signal	(24) I	(24) —
(25) 25	(25) 0.35	(25) OG / VT	(25) 1362	(25) Passenger Seat Belt Switch Signal	(25) I	(25) —
26	—	—	—	Not Occupied	—	—
(27) 27	(27) 0.5	(27) BK / OG	(27) 6628	(27) Left Front Side Impact Sensor Low Reference	(27) I	(27) —
(28) 28	(28) 0.5	(28) OG / GN	(28) 2132	(28) Left Front Side Impact Sensor Signal	(28) I	(28) —
29 - 36	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(37) 37	(37) 0.5	(37) OG / GY	(37) 5021	(37) Right Front Roof Rail Air Bag High Control	(37) I	(37) —
(38) 38	(38) 0.5	(38) WH / OG	(38) 5022	(38) Right Front Roof Rail Air Bag Low Control	(38) I	(38) —
(39) 39	(39) 0.5	(39) BU / OG	(39) 4957	(39) Passenger Seat Back Air Bag Low Control	(39) I	(39) —
(40) 40	(40) 0.5	(40) OG / GY	(40) 4956	(40) Passenger Seat Back Air Bag High Control	(40) I	(40) —
(41) 41	(41) 0.5	(41) BK / OG	(41) 6629	(41) Right Front Side Impact Sensor Low Reference	(41) I	(41) —
(42) 42	(42) 0.5	(42) BN / OG	(42) 2134	(42) Right Front Side Impact Sensor Signal	(42) I	(42) —
43 - 50	—	—	—	Not Occupied	—	—
(51) 51	(51) 0.5	(51) OG / GN	(51) 5019	(51) Left Front Roof Rail Air Bag High Control	(51) I	(51) —
(52) 52	(52) 0.5	(52) VT / OG	(52) 5020	(52) Left Front Roof Rail Air Bag Low Control	(52) I	(52) —
(53) 53	(53) 0.5	(53) BK / OG	(53) 4963	(53) Driver Seat Back Air Bag Low Control	(53) I	(53) —
(54) 54	(54) 0.5	(54) OG / BU	(54) 4962	(54) Driver Seat Back Air Bag High Control	(54) I	(54) —
(55) 55	(55) 0.5	(55) BK / OG	(55) 6623	(55) Left Rear Side Impact Sensor Low Reference	(55) I	(55) —
(56) 56	(56) 0.5	(56) OG / BU	(56) 6622	(56) Left Rear Side Impact Sensor Signal	(56) I	(56) —

K38 Chassis Control Module



3621452

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 12707495
- Service Connector: 85761018
- Description: 66-Way F 0.64, 2.8 MX123 Series, Sealed(BK with BK Terminal Position Assurance)

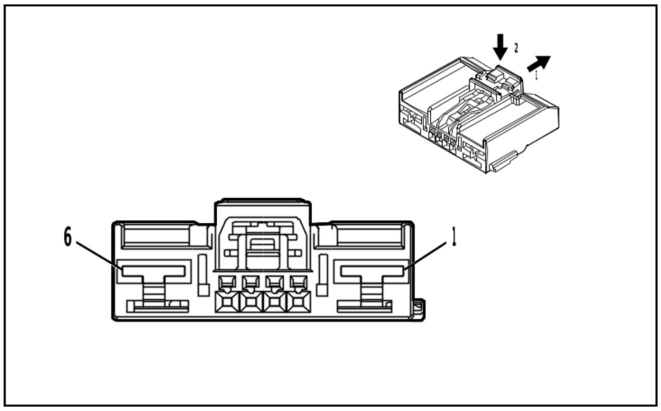
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13587518	J-35616-35 (VT)	J-38125-11A
II	19351723	J-35616-64B (L-BU)	J-38125-213

K38 Chassis Control Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.5	(6) VT / WH	(6) 639	(6) Run/Crank Ignition 1 Voltage	(6) II	(6) —
7 - 12	—	—	—	Not Occupied	—	—
(13) 13	(13) 0.5	(13) YE / GN	(13) 7122	(13) Axle Differential Lock Switch Signal	(13) II	(13) —
14 - 33	—	—	—	Not Occupied	—	—
(34) 34	(34) 0.5	(34) BU / YE	(34) 4979	(34) AUTOSAR CAN Bus [+] 2 Serial Data	(34) II	(34) —
(35) 35	(35) 0.5	(35) BU / YE	(35) 4979	(35) AUTOSAR CAN Bus [+] 2 Serial Data	(35) II	(35) —
(36) 36	(36) 0.5	(36) WH	(36) 4978	(36) AUTOSAR CAN Bus [-] 2 Serial Data	(36) II	(36) —
(37) 37	(37) 0.5	(37) WH	(37) 4978	(37) AUTOSAR CAN Bus [-] 2 Serial Data	(37) II	(37) —
(38) 38	(38) 0.5	(38) YE	(38) 7115	(38) Rear Axle Differential Lock Indicator Control	(38) II	(38) —
39 - 43	—	—	—	Not Occupied	—	—
(44) 44	(44) 0.75	(44) GY / BK	(44) 7253	(44) Rear Differential Lock Actuator Low Control	(44) II	(44) —
45 - 49	—	—	—	Not Occupied	—	—
(50) 50	(50) 0.75	(50) VT / BN	(50) 7258	(50) Rear Differential Lock Actuator Control	(50) II	(50) —
51 - 64	—	—	—	Not Occupied	—	—
(65) 65	(65) 1.5	(65) BK	(65) 1850	(65) Ground	(65) I	(65) —
(66) 66	(66) 1.5	(66) RD / BN	(66) 5940	(66) Battery Positive Voltage	(66) I	(66) —

K40D Driver Seat Adjuster Memory Module X1 (A45)



4650258

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 7289-7139-30
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64, 6.3 Series(BK)

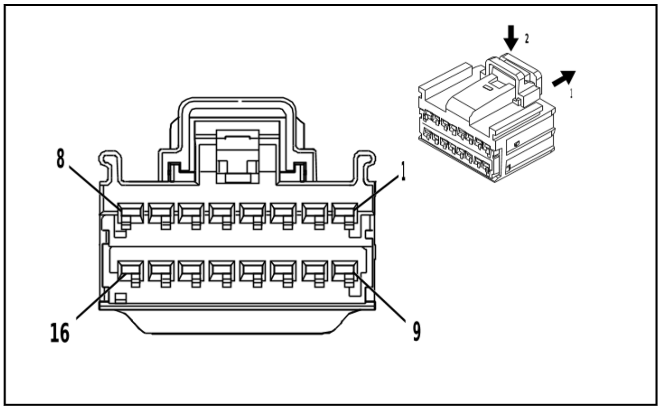
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-64B (L-BU)	No Tool Required

K40D Driver Seat Adjuster Memory Module X1 (A45)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) BK	(1) 1550	(1) Ground	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) RD / BN	(3) 2240	(3) Battery Positive Voltage	(3) II	(3) —
4 - 5	—	—	—	Not Occupied	—	—
(6) 6	(6) 2.5	(6) RD / YE	(6) 5040	(6) Battery Positive Voltage	(6) I	(6) —

K40D Driver Seat Adjuster Memory Module X2 (A45)



4332214

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 15512506
- Service Connector: Service by Harness - See Part Catalog
- Description: 16-Way F 1.5 OCS Series(BK)

Terminal Part Information

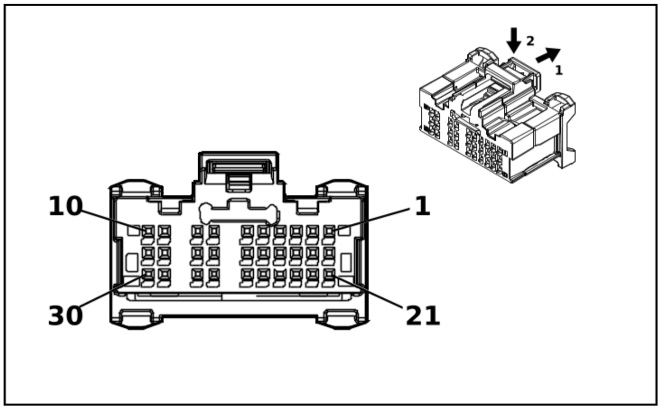
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

K40D Driver Seat Adjuster Memory Module X2 (A45)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) YE / BU	(1) 285	(1) Driver Seat Horizontal Motor Forward Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) GN / YE	(3) 276	(3) Driver Seat Recline Motor Forward Control	(3) I	(3) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
4 - 5	—	—	—	Not Occupied	—	—
(6) 6	(6) 1.5	(6) BU / VT	(6) 287	(6) Driver Seat Front Vertical Motor Down Control	(6) I	(6) —
(7) 7	(7) 1.5	(7) YE	(7) 282	(7) Driver Seat Rear Vertical Motor Up Control	(7) I	(7) —
8	—	—	—	Not Occupied	—	—
(9) 9	(9) 1.5	(9) BU / YE	(9) 277	(9) Driver Seat Recline Motor Rearward Control	(9) I	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 1.5	(11) GY / GN	(11) 284	(11) Driver Seat Horizontal Motor Rearward Control	(11) I	(11) —
12	—	—	—	Not Occupied	—	—
(13) 13	(13) 1.5	(13) GY / BU	(13) 283	(13) Driver Seat Rear Vertical Motor Down Control	(13) I	(13) —
14 - 15	—	—	—	Not Occupied	—	—
(16) 16	(16) 1.5	(16) GN / BN	(16) 286	(16) Driver Seat Front Vertical Motor Up Control	(16) I	(16) —

K40D Driver Seat Adjuster Memory Module X3 (A45)



5202284

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 2309644-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 30-Way F 0.5 MQS Series(BK)

Terminal Part Information

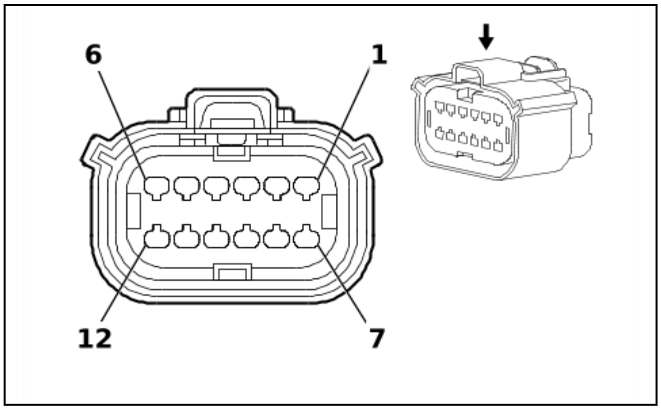
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required

K40D Driver Seat Adjuster Memory Module X3 (A45)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.35	(2) BU / GN	(2) 614	(2) Seat Memory Switch Set Signal	(2) I	(2) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.35	(5) BN	(5) 3038	(5) Driver Seat Right Rear Haptic Movement Motor Control	(5) I	(5) —
(6) 6	(6) 0.35	(6) YE / BN	(6) 3037	(6) Driver Seat Left Rear Haptic Movement Motor Control	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.35	(8) GN / WH	(8) 7530	(8) Driver Seat Adjuster Memory Module LIN Bus 1	(8) I	(8) —
(9) 9	(9) 0.35	(9) WH	(9) 4100	(9) AUTOSAR CAN Bus [-] 4 Serial Data	(9) I	(9) —
(10) 10	(10) 0.35	(10) BU / VT	(10) 4101	(10) AUTOSAR CAN Bus [+] 4 Serial Data	(10) I	(10) —
11 - 15	—	—	—	Not Occupied	—	—
(16) 16	(16) 0.35	(16) WH	(16) 615	(16) Seat Memory Switch Signal 1	(16) I	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.35	(18) GN / GY	(18) 3758	(18) Driver Seat Adjuster Memory Module LIN Bus 2	(18) I	(18) —
(19) 19	(19) 0.35	(19) WH	(19) 4100	(19) AUTOSAR CAN Bus [-] 4 Serial Data	(19) I	(19) —
(20) 20	(20) 0.35	(20) BU / VT	(20) 4101	(20) AUTOSAR CAN Bus [+] 4 Serial Data	(20) I	(20) —
21 - 30	—	—	—	Not Occupied	—	—

K43 Power Steering Control Module X1



1825165

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 33472-1216
- Service Connector: 19352907
- Description: 12-Way F 1.5 MX Series, Sealed(BK)

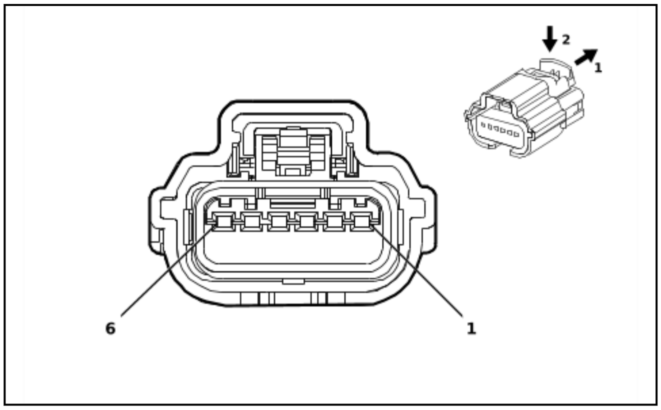
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85528055	J-35616-2A (GY)	J-38125-217

K43 Power Steering Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU	(1) 4987	(1) AUTOSAR CAN Bus [+] 1 Serial Data	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH	(2) 4986	(2) AUTOSAR CAN Bus [-] 1 Serial Data	(2) I	(2) —
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) RD / WH	(5) 5740	(5) Battery Positive Voltage	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) BU	(7) 4987	(7) AUTOSAR CAN Bus [+] 1 Serial Data	(7) I	(7) —
(8) 8	(8) 0.5	(8) WH	(8) 4986	(8) AUTOSAR CAN Bus [-] 1 Serial Data	(8) I	(8) —
9 - 10	—	—	—	Not Occupied	—	—
(11) 11	(11) 1	(11) BK / WH	(11) 1151	(11) Signal Ground	(11) I	(11) —
12	—	—	—	Not Occupied	—	—

K43 Power Steering Control Module X2



5157678

Connector Part Information
- Harness Type: Power Steering Control Module Wiring Harness
- OEM Connector: 31404-7132
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 64 Series, Sealed(BK)

Terminal Part Information

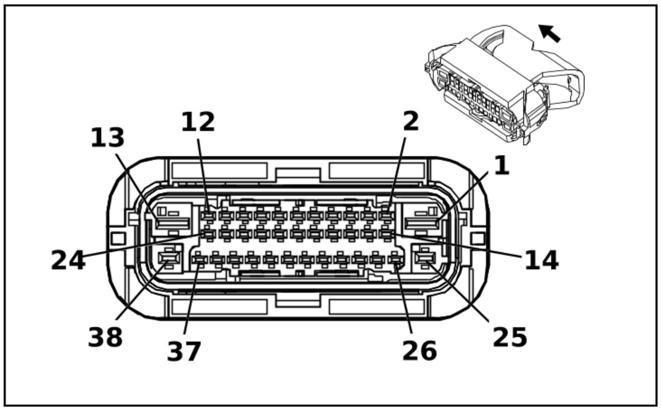
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K43 Power Steering Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) BK	(1) 8023	(1) Hydraulic Pressure Sensor Low Reference	(1) I	(1) —
(2) 2	(2) —	(2) RD	(2) 3130	(2) Steering Hydraulic Pressure Sensor 5 Volt Reference	(2) I	(2) —
3	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(4) 4	(4) —	(4) WH	(4) 3128	(4) Steering Hydraulic Pressure Sensor Left Signal	(4) I	(4) —
(5) 5	(5) —	(5) GN	(5) 3129	(5) Steering Hydraulic Pressure Sensor Right Signal	(5) I	(5) —
6	—	—	—	Not Occupied	—	—

K44 Power Takeoff Control Module X1



5199902

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 35503406
- Service Connector: 85761012
- Description: 38-Way F 1.5, 2.8, 4.8 MCP Series, Sealed(BK with BK Inner Connector)

Terminal Part Information

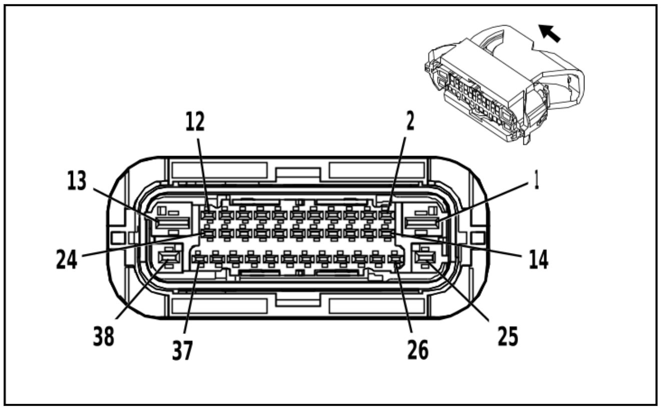
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19368624	J-35616-35 (VT)	J-38125-556
II	19369235	J-35616-14 (GN)	EL-38125-560A
III	85158596	J-35616-40 (BU)	J-38125-556

K44 Power Takeoff Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / BU	(1) 4540	(1) Battery Positive Voltage	(1) III	(1) —
2 - 12	—	—	—	Not Occupied	—	—
(13) 13	(13) 1.5	(13) BK / WH	(13) 251	(13) Signal Ground	(13) III	(13) —
(14) 14	(14) 0.5	(14) VT / GN	(14) 4320	(14) Powertrain Sensor Bus Enable	(14) II	(14) —
(15) 15	(15) 0.5	(15) GN / WH	(15) 488	(15) Power Take-Off Control Switch Signal	(15) II	(15) —
16 - 17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.5	(18) BN / GN	(18) 4311	(18) Power Take-Off Enable Cabin Switch Normally Closed Signal	(18) II	(18) —
19 - 21	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(22) 22	(22) 0.5	(22) BN / YE	(22) 11438	(22) Power Take Off Wakeup Signal	(22) II	(22) —
23 - 24	—	—	—	Not Occupied	—	—
(25) 25	(25) 0.5	(25) GY / GN	(25) 6239	(25) Transmission Power Take-Off Engage/ Disengage Signal Power	(25) I	(25) —
(26) 26	(26) 0.5	(26) WH	(26) 4055	(26) Private Serial Data Powertrain CAN Bus [+] Serial Data	(26) II	(26) —
(27) 27	(27) 0.5	(27) WH	(27) 4055	(27) Private Serial Data Powertrain CAN Bus [+] Serial Data	(27) II	(27) —
(28) 28	(28) 0.5	(28) BU / GY	(28) 4054	(28) Private Serial Data Powertrain CAN Bus [-] Serial Data	(28) II	(28) —
(29) 29	(29) 0.5	(29) BU / GY	(29) 4054	(29) Private Serial Data Powertrain CAN Bus [-] Serial Data	(29) II	(29) —
30 - 38	—	—	—	Not Occupied	—	—

K44 Power Takeoff Control Module X2



5141918

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 35497871
- Service Connector: 86825459
- Description: 38-Way F 1.5, 2.8, 4.8 MCP Series, Sealed(BK with BN Inner Connector)

Terminal Part Information

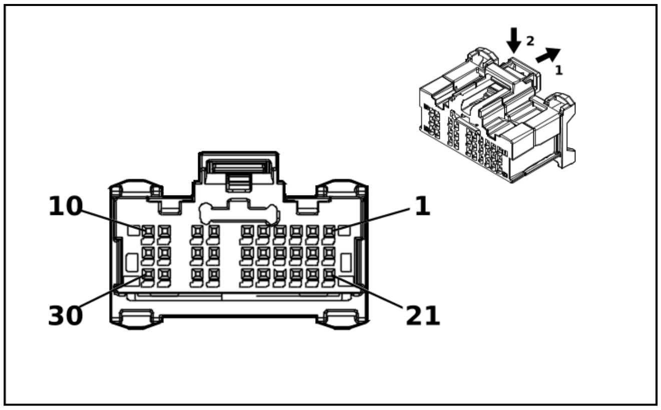
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19369235	J-35616-14 (GN)	EL-38125-560A
II	85158596	J-35616-40 (BU)	J-38125-556

K44 Power Takeoff Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.5	(8) WH / BK	(8) 8238	(8) Power Take Off Upfitter Interlock Switch Signal 2	(8) I	(8) —
(9) 9	(9) 0.5	(9) GN / WH	(9) 8236	(9) Power Take Off Solenoid Control Low	(9) I	(9) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(10) 10	(10) 0.5	(10) GN / WH	(10) 8236	(10) Power Take Off Solenoid Control Low	(10) I	(10) —
11 - 12	—	—	—	Not Occupied	—	—
(13) 13	(13) 0.5	(13) BU / WH	(13) 8235	(13) Power Take Off Solenoid Control High	(13) II	(13) —
14 - 16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.5	(17) WH	(17) 8232	(17) Power Take Off Pressure Sensor 5 Volt Reference	(17) I	(17) —
(18) 18	(18) 0.5	(18) YE	(18) 8233	(18) Power Take Off Pressure Sensor Low Reference	(18) I	(18) —
(19) 19	(19) 0.5	(19) BN / WH	(19) 8234	(19) Power Take Off Pressure Sensor Signal	(19) I	(19) —
20 - 27	—	—	—	Not Occupied	—	—
(28) 28	(28) 0.5	(28) WH / GN	(28) 6142	(28) Power Take-Off Engine Shutdown Signal	(28) I	(28) —
29 - 34	—	—	—	Not Occupied	—	—
(35) 35	(35) 0.5	(35) VT / GN	(35) 4308	(35) Power Take-Off Remote Throttle Signal	(35) I	(35) —
(36) 36	(36) 0.5	(36) BU / BN	(36) 4408	(36) Power Take-Off Enable Signal	(36) I	(36) —
37 - 38	—	—	—	Not Occupied	—	—

K56 Serial Data Gateway Module X1



5202284

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 2309644-1
- Service Connector: 84766507
- Description: 30-Way F 0.5 MQS Series(BK)

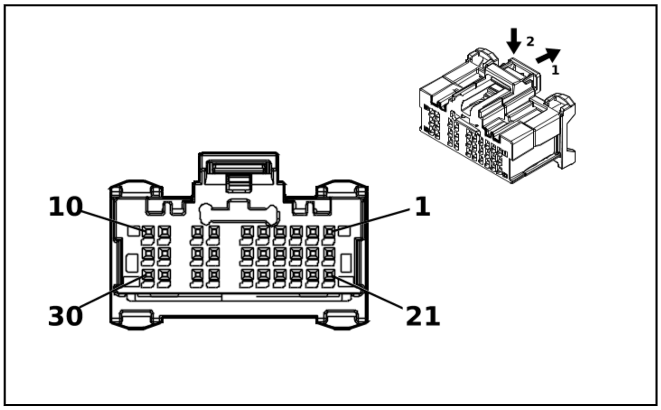
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19370262	EL-35616-58 (BK)	EL-38125-58

K56 Serial Data Gateway Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) RD / VT	(1) 3340	(1) Battery Positive Voltage	(1) I	(1) —
2 - 3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.35	(4) BK / WH	(4) 851	(4) Signal Ground	(4) I	(4) —
(5) 5	(5) 0.35	(5) BU	(5) 4987	(5) AUTOSAR CAN Bus [+] 1 Serial Data	(5) I	(5) —
(6) 6	(6) 0.35	(6) WH	(6) 4986	(6) AUTOSAR CAN Bus [-] 1 Serial Data	(6) I	(6) —
(7) 7	(7) 0.35	(7) WH	(7) 4100	(7) AUTOSAR CAN Bus [-] 4 Serial Data	(7) I	(7) —
(8) 8	(8) 0.35	(8) BU / VT	(8) 4101	(8) AUTOSAR CAN Bus [+] 4 Serial Data	(8) I	(8) —
(9) 9	(9) 0.35	(9) WH	(9) 4976	(9) AUTOSAR CAN Bus [-] 3 Serial Data	(9) I	(9) —
(10) 10	(10) 0.35	(10) BU / BK	(10) 4977	(10) AUTOSAR CAN Bus [+] 3 Serial Data	(10) I	(10) —
11 - 14	—	—	—	Not Occupied	—	—
(15) 15	(15) 0.35	(15) BU	(15) 4987	(15) AUTOSAR CAN Bus [+] 1 Serial Data	(15) I	(15) —
(16) 16	(16) 0.35	(16) WH	(16) 4986	(16) AUTOSAR CAN Bus [-] 1 Serial Data	(16) I	(16) —
(17) 17	(17) 0.35	(17) WH	(17) 4978	(17) AUTOSAR CAN Bus [-] 2 Serial Data	(17) I	(17) —
(18) 18	(18) 0.35	(18) BU / YE	(18) 4979	(18) AUTOSAR CAN Bus [+] 2 Serial Data	(18) I	(18) —
(19) 19	(19) 0.35	(19) BU / YE	(19) 4984	(19) AUTOSAR CAN Bus [-] 5 Serial Data	(19) I	(19) —
(20) 20	(20) 0.35	(20) BU / WH	(20) 4985	(20) AUTOSAR CAN Bus [+] 5 Serial Data	(20) I	(20) —
21 - 24	—	—	—	Not Occupied	—	—
(25) 25	(25) 0.35	(25) BU	(25) 4987	(25) AUTOSAR CAN Bus [+] 1 Serial Data	(25) I	(25) —
(26) 26	(26) 0.35	(26) WH	(26) 4986	(26) AUTOSAR CAN Bus [-] 1 Serial Data	(26) I	(26) —
(27) 27	(27) 0.35	(27) WH	(27) 4978	(27) AUTOSAR CAN Bus [-] 2 Serial Data	(27) I	(27) —
(28) 28	(28) 0.35	(28) BU / YE	(28) 4979	(28) AUTOSAR CAN Bus [+] 2 Serial Data	(28) I	(28) —
(29) 29	(29) 0.35	(29) BU / YE	(29) 4984	(29) AUTOSAR CAN Bus [-] 5 Serial Data	(29) I	(29) —
(30) 30	(30) 0.35	(30) BU / WH	(30) 4985	(30) AUTOSAR CAN Bus [+] 5 Serial Data	(30) I	(30) —

K56 Serial Data Gateway Module X2



5203942

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 2309644-2
- Service Connector: 84766509
- Description: 30-Way F 0.5 MQS Series(BK with L-GY Front Housing)

Terminal Part Information

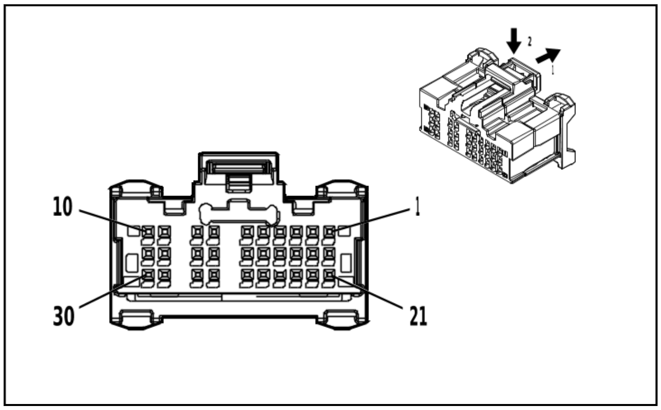
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19370262	EL-35616-58 (BK)	EL-38125-58
II	Service by Cable	EL-35616-58 (BK)	EL-38125-58

K56 Serial Data Gateway Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.35	(5) BK / GY	(5) 3559	(5) Passive Start Switch 2 Low Reference	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.35	(7) GN / VT	(7) 5199	(7) Run/Crank Relay Coil Control	(7) I	(7) —
8	—	—	—	Not Occupied	—	—
(9) 9	(9) 0.35	(9) BU	(9) 4973	(9) Ethernet Bus 1R [+]	(9) II	(9) —
(10) 10	(10) 0.35	(10) YE	(10) 4972	(10) Ethernet Bus 1R [-]	(10) II	(10) —
11 - 12	—	—	—	Not Occupied	—	—
(13) 13	(13) 0.35	(13) BU / BN	(13) 4983	(13) AUTOSAR CAN Bus [+] 7 Serial Data	(13) I	(13) —
(14) 14	(14) 0.35	(14) WH	(14) 4982	(14) AUTOSAR CAN Bus [-] 7 Serial Data	(14) I	(14) —
(15) 15	(15) 0.35	(15) GN / BK	(15) 3558	(15) Passive Start Switch Signal 2	(15) I	(15) —
(16) 16	(16) 0.35	(16) WH	(16) 4980	(16) AUTOSAR CAN Bus [-] 6 Serial Data	(16) I	(16) —
(17) 17	(17) 0.35	(17) GN	(17) 2578	(17) Private Serial Data Presentation CAN Bus [+] 1 Serial Data	(17) I	(17) —
(18) 18	(18) 0.35	(18) BN	(18) 2577	(18) Private Serial Data Presentation CAN Bus [-] 1 Serial Data	(18) I	(18) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(19) 19	(19) 0.35	(19) WH	(19) 7207	(19) Ethernet Bus 1 Enable Signal	(19) I	(19) —
20 - 22	—	—	—	Not Occupied	—	—
(23) 23	(23) 0.35	(23) BU / WH	(23) 4985	(23) AUTOSAR CAN Bus [+] 5 Serial Data	(23) I	(23) —
(24) 24	(24) 0.35	(24) BU / YE	(24) 4984	(24) AUTOSAR CAN Bus [-] 5 Serial Data	(24) I	(24) —
25	—	—	—	Not Occupied	—	—
(26) 26	(26) 0.35	(26) YE	(26) 4981	(26) AUTOSAR CAN Bus [+] 6 Serial Data	(26) I	(26) —
(27) 27	(27) 0.35	(27) VT	(27) 2580	(27) Private Serial Data Presentation CAN Bus [+] 2 Serial Data	(27) I	(27) —
(28) 28	(28) 0.35	(28) GY	(28) 2579	(28) Private Serial Data Presentation CAN Bus [-] 2 Serial Data	(28) I	(28) —
(29) 29	(29) 0.35	(29) BU	(29) 4975	(29) Ethernet Bus 1T [+]	(29) II	(29) —
(30) 30	(30) 0.35	(30) GN	(30) 4974	(30) Ethernet Bus 1T [-]	(30) II	(30) —

K56 Serial Data Gateway Module X3



4900333

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 2309644-3
- Service Connector: 13519319
- Description: 30-Way F 0.5 MQS Series(BK with D-GY Front Housing)

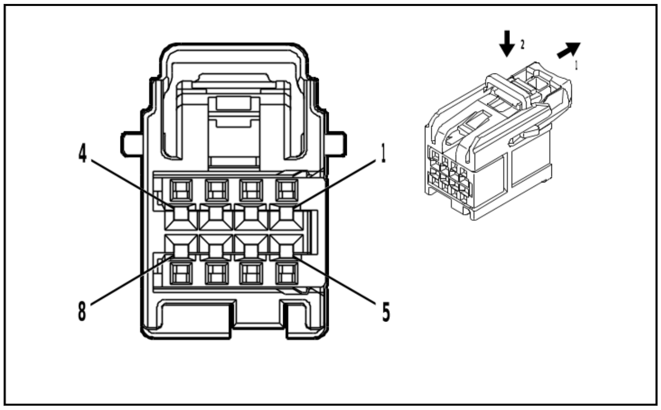
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Service by Cable	EL-35616-58 (BK)	EL-38125-58

K56 Serial Data Gateway Module X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.35 (7) 0.35	(7) YE (7) BN	(7) 4758 (7) 7211	(7) Ethernet Bus 2 [+] (7) Ethernet Bus 4 [+]	(7) I (7) I	(7) IOK (7) IOR
(8) 8	(8) 0.35 (8) 0.35	(8) BU (8) GY	(8) 4757 (8) 7210	(8) Ethernet Bus 2 [-] (8) Ethernet Bus 4 [-]	(8) I (8) I	(8) IOK (8) IOR
(9) 9	(9) 0.35	(9) YE	(9) 4758	(9) Ethernet Bus 2 [+]	(9) I	(9) —
(10) 10	(10) 0.35	(10) BU	(10) 4757	(10) Ethernet Bus 2 [-]	(10) I	(10) —
11 - 26	—	—	—	Not Occupied	—	—
(27) 27	(27) 0.35	(27) GN	(27) 7217	(27) Ethernet Bus 7 [+]	(27) I	(27) —
(28) 28	(28) 0.35	(28) WH	(28) 7216	(28) Ethernet Bus 7 [-]	(28) I	(28) —
29 - 30	—	—	—	Not Occupied	—	—

K56U Special Purpose Vehicle Control Module



4935776

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 15526972
- Service Connector: 19370429
- Description: 8-Way F 0.64 OCS Series(BK)

Terminal Part Information

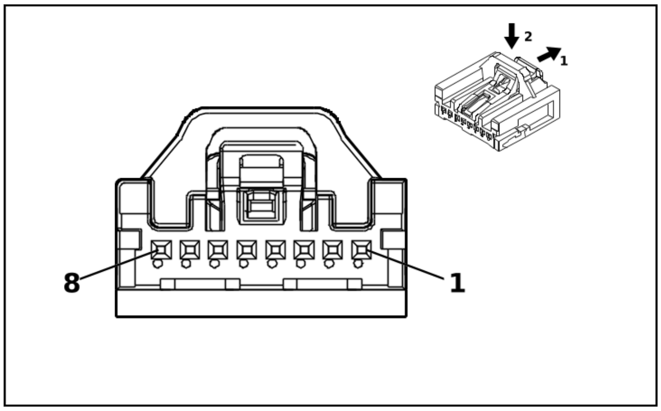
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

K56U Special Purpose Vehicle Control Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) RD / VT	(1) 4640	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU	(2) 4987	(2) AUTOSAR CAN Bus [+] 1 Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) WH	(3) 4986	(3) AUTOSAR CAN Bus [-] 1 Serial Data	(3) I	(3) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(4) 4	(4) 0.75	(4) BK	(4) 1050	(4) Ground	(4) I	(4) —
5 - 8	—	—	—	Not Occupied	—	—

K60 Column Lock Module



5200269

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35068228
- Service Connector: 84769201
- Description: 8-Way F Mini 50 Series(BK)

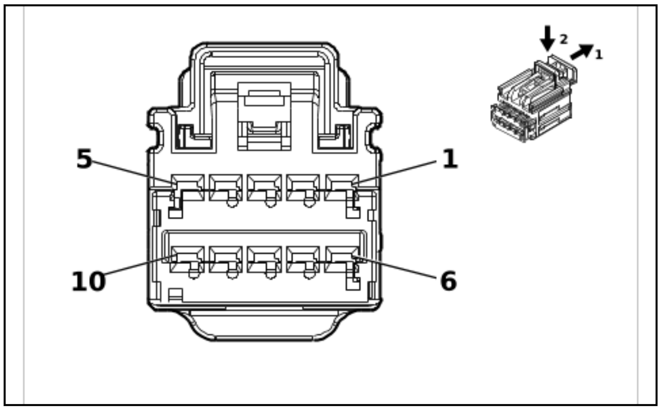
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required
II	Not required	J-35616-12 (BU)	No Tool Required

K60 Column Lock Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35 (1) 0.35	(1) RD / VT (1) RD / VT	(1) 3340 (1) 3340	(1) Battery Positive Voltage (1) Battery Positive Voltage	(1) I (1) II	(1) — (1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35 (3) 0.35	(3) BK (3) BK	(3) 1050 (3) 1050	(3) Ground (3) Ground	(3) I (3) II	(3) — (3) —
(4) 4	(4) 0.35 (4) 0.35	(4) BU (4) BU	(4) 4987 (4) 4987	(4) AUTOSAR CAN Bus [+] 1 Serial Data (4) AUTOSAR CAN Bus [+] 1 Serial Data	(4) I (4) II	(4) — (4) —
(5) 5	(5) 0.35	(5) BU	(5) 4987	(5) AUTOSAR CAN Bus [+] 1 Serial Data	(5) II	(5) —
(6) 6	(6) 0.35 (6) 0.35	(6) WH (6) WH	(6) 4986 (6) 4986	(6) AUTOSAR CAN Bus [-] 1 Serial Data (6) AUTOSAR CAN Bus [-] 1 Serial Data	(6) I (6) II	(6) — (6) —
(7) 7	(7) 0.35	(7) WH	(7) 4986	(7) AUTOSAR CAN Bus [-] 1 Serial Data	(7) II	(7) —
(8) 8	(8) 0.35 (8) 0.35	(8) BU / VT (8) BU / VT	(8) 807 (8) 807	(8) Ignition Off/Accessory Ignition Voltage (8) Ignition Off/Accessory Ignition Voltage	(8) I (8) II	(8) — (8) —

K61 Sunroof Control Module (CF5)



6153939

Connector Part Information

- Harness Type: Sunroof Wiring Harness
- OEM Connector: 15512475
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 1.5 OCS Series(BK)

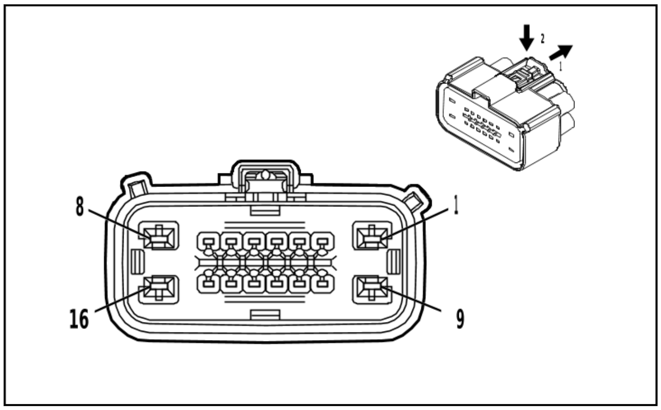
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

K61 Sunroof Control Module (CF5)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.35	(6) GY / BN	(6) 2854	(6) Body Control Module LIN Bus 8	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 1.5	(8) RD / GY	(8) 4540	(8) Battery Positive Voltage	(8) I	(8) —
9	—	—	—	Not Occupied	—	—
(10) 10	(10) 1.5	(10) BK	(10) 1050	(10) Ground	(10) I	(10) —

K67 Trailer Brake Control Module



4624589

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 34985-4016
- Service Connector: 13599889
- Description: 16-Way F 1.5, 2.8 MX Series, Sealed(GY)

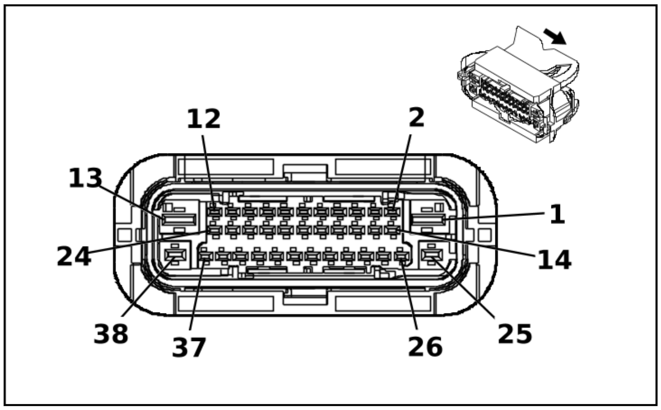
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13576377	J-35616-35 (VT)	J-38125-12A
II	85528055	J-35616-2A (GY)	J-38125-217

K67 Trailer Brake Control Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) RD / BN	(1) 3640	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / BK	(2) 2223	(2) Trailer Brake Apply Signal	(2) II	(2) —
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) YE / BK	(5) 2224	(5) Trailer Brake Enable Signal	(5) II	(5) —
6 - 7	—	—	—	Not Occupied	—	—
(8) 8	(8) 2.5	(8) BU	(8) 47	(8) Trailer Auxiliary Control	(8) I	(8) —
(9) 9	(9) 2.5	(9) BK	(9) 1850	(9) Ground	(9) I	(9) —
10 - 11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.5	(12) GN / BU	(12) 2733	(12) Brake System Control Module LIN Bus 2	(12) II	(12) —
13 - 16	—	—	—	Not Occupied	—	—

K68 Trailer Lamp Control Module



5199340

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 35810688
- Service Connector: 86825458
- Description: 38-Way F 1.5, 2.8, 4.8 MCP Series, Sealed(BK with BN Inner Connector)

Terminal Part Information

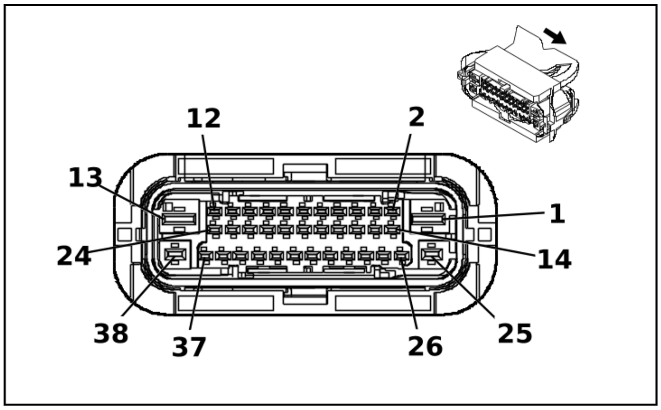
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19368624	J-35616-35 (VT)	J-38125-556
II	19369235	J-35616-14 (GN)	EL-38125-560A
III	85158596	J-35616-40 (BU)	J-38125-556

K68 Trailer Lamp Control Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) RD / VT	(1) 5640	(1) Battery Positive Voltage	(1) III	(1) —
(2) 2	(2) 1	(2) YE	(2) 1618	(2) Left Rear Trailer Stop/Turn Lamp Control	(2) II	(2) —
(3) 3	(3) 1	(3) GN	(3) 1619	(3) Right Rear Trailer Stop/Turn Lamp Control	(3) II	(3) —
4 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 1	(7) GY	(7) 1624	(7) Trailer Backup Lamp Control	(7) II	(7) —
8 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.5	(10) VT / BK	(10) 739	(10) Run/Crank Ignition 1 Voltage	(10) II	(10) —
(11) 11	(11) 0.5	(11) BN / YE	(11) 820	(11) Center High Mounted Stop Lamp Supply Voltage	(11) II	(11) —
12	—	—	—	Not Occupied	—	—
(13) 13	(13) 2.5	(13) BK	(13) 1750	(13) Ground	(13) III	(13) —
14 - 24	—	—	—	Not Occupied	—	—
(25) 25	(25) 1	(25) BN	(25) 2109	(25) Trailer Park Lamp Control	(25) I	(25) —
26	—	—	—	Not Occupied	—	—
(27) 27	(27) 0.5	(27) BU / VT	(27) 4101	(27) AUTOSAR CAN Bus [+] 4 Serial Data	(27) II	(27) —
(28) 28	(28) 0.5	(28) WH	(28) 4100	(28) AUTOSAR CAN Bus [-] 4 Serial Data	(28) II	(28) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(29) 29	(29) 0.5	(29) BU / VT	(29) 4101	(29) AUTOSAR CAN Bus [+] 4 Serial Data	(29) II	(29) —
(30) 30	(30) 0.5	(30) WH	(30) 4100	(30) AUTOSAR CAN Bus [-] 4 Serial Data	(30) II	(30) —
31 - 37	—	—	—	Not Occupied	—	—
(38) 38	(38) 2.5	(38) RD / YE	(38) 5840	(38) Battery Positive Voltage	(38) I	(38) —

K69 Transfer Case Control Module (L5P)



5199340

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 35740703
- Service Connector: 86825458
- Description: 38-Way F 1.5, 2.8, 4.8 MCP Series, Sealed(BK with BN Inner Connector)

Terminal Part Information

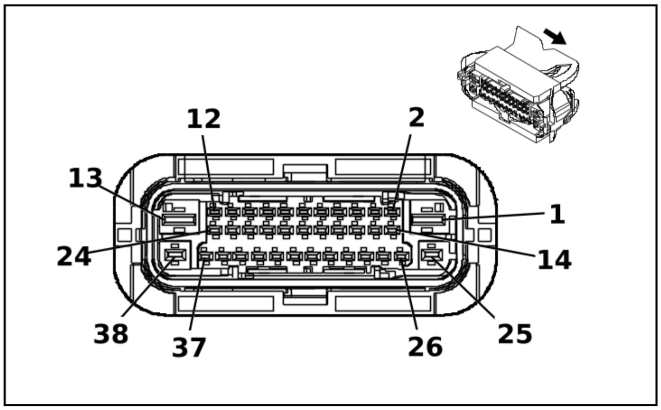
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19368624	J-35616-35 (VT)	J-38125-556
II	19369235	J-35616-14 (GN)	EL-38125-560A
III	85158596	J-35616-40 (BU)	J-38125-556

K69 Transfer Case Control Module (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 3	(1) GN / RD	(1) 6042	(1) Cruise Control Switch 5V Reference	(1) III	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) BU / YE	(3) 4979	(3) AUTOSAR CAN Bus [+] 2 Serial Data	(3) II	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 4978	(4) AUTOSAR CAN Bus [-] 2 Serial Data	(4) II	(4) —
(5) 5	(5) 0.5	(5) WH / GN	(5) 7479	(5) Rotary Position Sensor Signal	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) YE	(7) 7474	(7) Incremental Encoder Direction Signal	(7) II	(7) —
8	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(9) 9	(9) 0.5	(9) YE / WH	(9) 1695	(9) 4WD Locked Range Indicator Control	(9) II	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.5	(11) VT / GY	(11) 8017	(11) Secondary Axle Motor Relay Control	(11) II	(11) —
(12) 12	(12) 0.5	(12) GY / BK	(12) 1570	(12) Front Axle Actuator Control	(12) II	(12) —
(13) 13	(13) 4	(13) YE / VT	(13) 1553	(13) Transfer Case Motor Counter Clockwise Control	(13) III	(13) —
14	—	—	—	Not Occupied	—	—
(15) 15	(15) 0.5	(15) BU / YE	(15) 4979	(15) AUTOSAR CAN Bus [+] 2 Serial Data	(15) II	(15) —
(16) 16	(16) 0.5	(16) WH	(16) 4978	(16) AUTOSAR CAN Bus [-] 2 Serial Data	(16) II	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.5	(18) VT / GN	(18) 439	(18) Run/Crank Ignition 1 Voltage	(18) II	(18) —
(19) 19	(19) 0.5	(19) BU / GY	(19) 7473	(19) Incremental Encoder Impulse Signal	(19) II	(19) —
(20) 20	(20) 0.5	(20) WH / RD	(20) 7477	(20) Gear Position Sensor 5V Reference	(20) II	(20) —
21 - 23	—	—	—	Not Occupied	—	—
(24) 24	(24) 0.5	(24) GN	(24) 8015	(24) Transfer Case Motor Low Reference	(24) II	(24) —
(25) 25	(25) 2.5	(25) BK	(25) 450	(25) Ground	(25) I	(25) —
26	—	—	—	Not Occupied	—	—
(27) 27	(27) 0.5	(27) GN	(27) 8014	(27) Transfer Case Lock Solenoid Low Reference	(27) II	(27) —
28 - 29	—	—	—	Not Occupied	—	—
(30) 30	(30) 0.5	(30) YE / BK	(30) 7478	(30) Gear Position Sensor Low Reference	(30) II	(30) —
(31) 31	(31) 0.5	(31) WH / GN	(31) 7475	(31) Incremental Encoder Sensor Voltage Reference	(31) II	(31) —
32	—	—	—	Not Occupied	—	—
(33) 33	(33) 0.75	(33) BU	(33) 8013	(33) Transfer Case Lock Solenoid Control 2	(33) II	(33) —
(34) 34	(34) 0.75	(34) YE / BN	(34) 1569	(34) Transfer Case Lock Solenoid Valve Control	(34) II	(34) —
35	—	—	—	Not Occupied	—	—
(36) 36	(36) 0.5	(36) VT	(36) 7476	(36) Incremental Encoder Sensor Low Reference	(36) II	(36) —
37	—	—	—	Not Occupied	—	—
(38) 38	(38) 2.5	(38) YE / GY	(38) 1552	(38) Transfer Case Motor Clockwise Control	(38) I	(38) —

K69 Transfer Case Control Module (L8T)



5199340

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 35497867
- Service Connector: 86825458
- Description: 38-Way F 1.5, 2.8, 4.8 MCP Series, Sealed(BK with BN Inner Connector)

Terminal Part Information

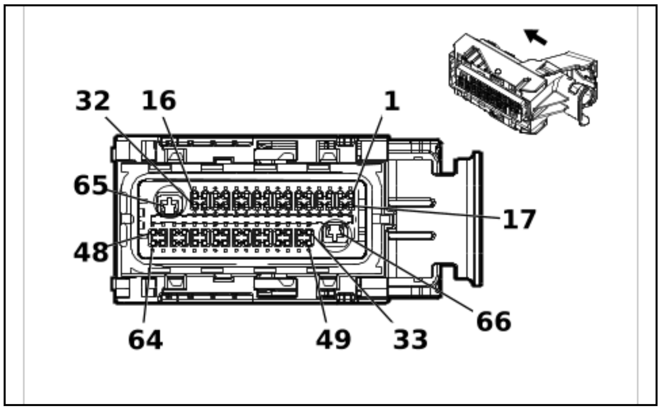
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19368624	J-35616-35 (VT)	J-38125-556
II	19369235	J-35616-14 (GN)	EL-38125-560A
III	85158596	J-35616-40 (BU)	J-38125-556

K69 Transfer Case Control Module (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 3	(1) GN / RD	(1) 6042	(1) Cruise Control Switch 5V Reference	(1) III	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) BU / YE	(3) 4979	(3) AUTOSAR CAN Bus [+] 2 Serial Data	(3) II	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 4978	(4) AUTOSAR CAN Bus [-] 2 Serial Data	(4) II	(4) —
(5) 5	(5) 0.5	(5) WH / GN	(5) 7479	(5) Rotary Position Sensor Signal	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) YE	(7) 7474	(7) Incremental Encoder Direction Signal	(7) II	(7) —
8	—	—	—	Not Occupied	—	—
(9) 9	(9) 0.5	(9) YE / WH	(9) 1695	(9) 4WD Locked Range Indicator Control	(9) II	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.5	(11) VT / GY	(11) 8017	(11) Secondary Axle Motor Relay Control	(11) II	(11) —
(12) 12	(12) 0.5	(12) GY / BK	(12) 1570	(12) Front Axle Actuator Control	(12) II	(12) —
(13) 13	(13) 4	(13) YE / VT	(13) 1553	(13) Transfer Case Motor Counter Clockwise Control	(13) III	(13) —
14	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(15) 15	(15) 0.5	(15) BU / YE	(15) 4979	(15) AUTOSAR CAN Bus [+] 2 Serial Data	(15) II	(15) —
(16) 16	(16) 0.5	(16) WH	(16) 4978	(16) AUTOSAR CAN Bus [-] 2 Serial Data	(16) II	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.5	(18) VT / GN	(18) 439	(18) Run/Crank Ignition 1 Voltage	(18) II	(18) —
(19) 19	(19) 0.5	(19) BU / GY	(19) 7473	(19) Incremental Encoder Impulse Signal	(19) II	(19) —
(20) 20	(20) 0.5	(20) WH / RD	(20) 7477	(20) Gear Position Sensor 5V Reference	(20) II	(20) —
21 - 23	—	—	—	Not Occupied	—	—
(24) 24	(24) 0.5	(24) GN	(24) 8015	(24) Transfer Case Motor Low Reference	(24) II	(24) —
(25) 25	(25) 2.5	(25) BK	(25) 450	(25) Ground	(25) I	(25) —
26	—	—	—	Not Occupied	—	—
(27) 27	(27) 0.5	(27) GN	(27) 8014	(27) Transfer Case Lock Solenoid Low Reference	(27) II	(27) —
28 - 29	—	—	—	Not Occupied	—	—
(30) 30	(30) 0.5	(30) YE / BK	(30) 7478	(30) Gear Position Sensor Low Reference	(30) II	(30) —
(31) 31	(31) 0.5	(31) WH / GN	(31) 7475	(31) Incremental Encoder Sensor Voltage Reference	(31) II	(31) —
32	—	—	—	Not Occupied	—	—
(33) 33	(33) 0.75	(33) BU	(33) 8013	(33) Transfer Case Lock Solenoid Control 2	(33) II	(33) —
(34) 34	(34) 0.75	(34) YE / BN	(34) 1569	(34) Transfer Case Lock Solenoid Valve Control	(34) II	(34) —
35	—	—	—	Not Occupied	—	—
(36) 36	(36) 0.5	(36) VT	(36) 7476	(36) Incremental Encoder Sensor Low Reference	(36) II	(36) —
37	—	—	—	Not Occupied	—	—
(38) 38	(38) 2.5	(38) YE / GY	(38) 1552	(38) Transfer Case Motor Clockwise Control	(38) I	(38) —

K71 Transmission Control Module



6758198

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 216741-0001
- Service Connector: 85761018
- Description: 66-Way F 0.64, 2.8 MX123 Series, Sealed(BK with BU Terminal Position Assurance)

Terminal Part Information

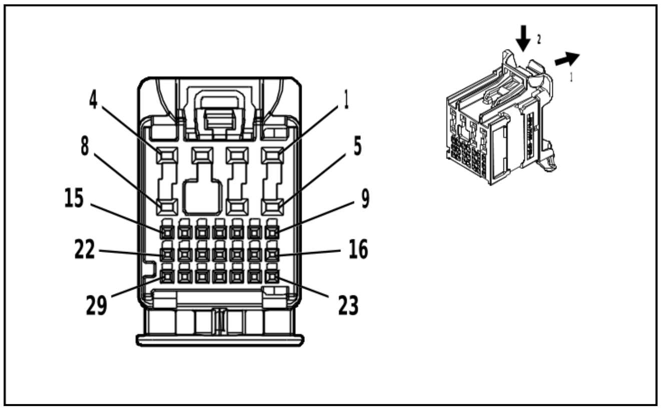
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13587518	J-35616-35 (VT)	J-38125-11A
II	19351723	J-35616-64B (L-BU)	J-38125-213

K71 Transmission Control Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / WH	(1) 422	(1) Torque Converter Clutch Solenoid Valve Control	(1) II	(1) —
(2) 2	(2) 0.5	(2) GY / GN	(2) 6403	(2) Clutch Solenoid Valve D Control	(2) II	(2) —
(3) 3	(3) 0.5	(3) WH / BU	(3) 4507	(3) Transmission Clutch H Control	(3) II	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 4508	(4) Transmission Clutch G Control	(4) II	(4) —
5 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) YE / GN	(7) 4170	(7) Transmission Output Shaft Speed Sensor Circuit 9V Reference	(7) II	(7) —
(8) 8	(8) 0.5	(8) YE / BU	(8) 4171	(8) Transmission Input Shaft Speed Sensor Circuit 9V Reference	(8) II	(8) —
9 - 11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.5	(12) GN / YE	(12) 6353	(12) Input Speed Signal	(12) II	(12) —
(13) 13	(13) 0.5	(13) GN / VT	(13) 4510	(13) Transmission Intermediate Speed Signal	(13) II	(13) —
(14) 14	(14) 0.5	(14) GY / BU	(14) 6358	(14) Output Speed Signal	(14) II	(14) —
(15) 15	(15) 0.5	(15) BN / WH	(15) 6254	(15) Transmission Input Speed Sensor Signal	(15) II	(15) —
16	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(17) 17	(17) 0.5	(17) GN / WH	(17) 1530	(17) Transmission Line Pressure Control Solenoid Valve Control	(17) II	(17) —
(18) 18	(18) 0.5	(18) YE / BN	(18) 6404	(18) Clutch Solenoid Valve E Control	(18) II	(18) —
(19) 19	(19) 0.5	(19) GY	(19) 6402	(19) Clutch Solenoid Valve C Control	(19) II	(19) —
(20) 20	(20) 0.5	(20) VT	(20) 4509	(20) Transmission Clutch F Control	(20) II	(20) —
21	—	—	—	Not Occupied	—	—
(22) 22	(22) 0.5	(22) GN / BK	(22) 7819	(22) Default Disable Solenoid Control	(22) II	(22) —
23 - 27	—	—	—	Not Occupied	—	—
(28) 28	(28) 0.5	(28) BK / BN	(28) 586	(28) Transmission Fluid Temperature Sensor Low Reference	(28) II	(28) —
29 - 32	—	—	—	Not Occupied	—	—
(33) 33	(33) 0.5	(33) GN / GY	(33) 6387	(33) Transmission High Side Driver 1 Control	(33) II	(33) —
34	—	—	—	Not Occupied	—	—
(35) 35	(35) 0.5	(35) VT / GN	(35) 439	(35) Run/Crank Ignition 1 Voltage	(35) II	(35) —
36	—	—	—	Not Occupied	—	—
(37) 37	(37) 0.5	(37) BU / YE	(37) 4979	(37) AUTOSAR CAN Bus [+] 2 Serial Data	(37) II	(37) —
(38) 38	(38) 0.5	(38) WH	(38) 4978	(38) AUTOSAR CAN Bus [-] 2 Serial Data	(38) II	(38) —
39 - 48	—	—	—	Not Occupied	—	—
(49) 49	(49) 0.5	(49) GY / BN	(49) 6388	(49) Transmission High Side Driver 2 Control	(49) II	(49) —
50 - 52	—	—	—	Not Occupied	—	—
(53) 53	(53) 0.5	(53) BU / YE	(53) 4979	(53) AUTOSAR CAN Bus [+] 2 Serial Data	(53) II	(53) —
(54) 54	(54) 0.5	(54) WH	(54) 4978	(54) AUTOSAR CAN Bus [-] 2 Serial Data	(54) II	(54) —
55 - 62	—	—	—	Not Occupied	—	—
(63) 63	(63) 0.5	(63) BN / WH	(63) 585	(63) Transmission Fluid Temperature Sensor Signal	(63) II	(63) —
(64) 64	(64) 0.5	(64) BU / WH	(64) 3338	(64) Transmission Internal Mode Switch Mode Control X	(64) II	(64) —
(65) 65	(65) 1.5	(65) BK / WH	(65) 251	(65) Signal Ground	(65) I	(65) —
(66) 66	(66) 1.5	(66) RD / GN	(66) 1840	(66) Battery Positive Voltage	(66) I	(66) —

K73 Telematic Control Module X1



4496253

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 160014-0014
- Service Connector: 13534974
- Description: 29-Way F 0.5 NANO, 1.2 MCON, stAK50h Series(BK with GY Inner Connector)

Terminal Part Information

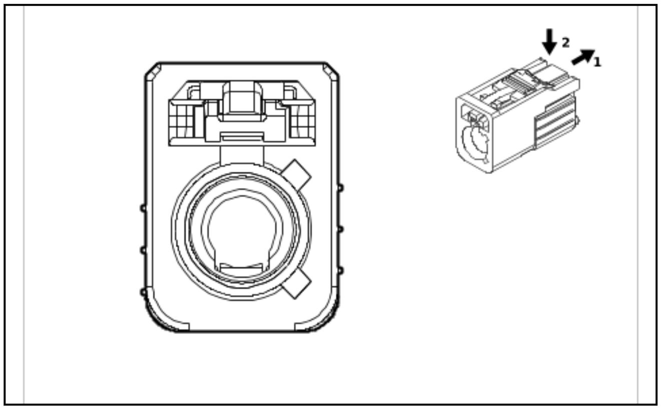
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A
II	Service by Cable	EL-35616-58 (BK)	EL-38125-58

K73 Telematic Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / YE	(1) 3040	(1) Battery Positive Voltage	(1) I	(1) —
2 - 3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.75	(4) BK / WH	(4) 1051	(4) Signal Ground	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.35	(6) GN / BK	(6) 2515	(6) Telematics Switch Supply Voltage	(6) I	(6) —
7 - 8	—	—	—	Not Occupied	—	—
(9) 9	(9) 0.35	(9) BU / YE	(9) 4984	(9) AUTOSAR CAN Bus [-] 5 Serial Data	(9) I	(9) —
(10) 10	(10) 0.35	(10) BU / WH	(10) 4985	(10) AUTOSAR CAN Bus [+] 5 Serial Data	(10) I	(10) —
(11) 11	(11) 0.35	(11) GN / WH	(11) 2514	(11) Telematics Switch Signal	(11) I	(11) —
12	—	—	—	Not Occupied	—	—
(13) 13	(13) 0.35	(13) BARE	(13) 1792	(13) Low Reference	(13) I	(13) —
(14) 14	(14) 0.35	(14) BK / GY	(14) 5152	(14) Voice Recognition Audio [-] Control	(14) I	(14) —
(15) 15	(15) 0.35	(15) GY / YE	(15) 5149	(15) Voice Recognition Audio Signal	(15) I	(15) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(16) 16	(16) 0.35	(16) BU / YE	(16) 4984	(16) AUTOSAR CAN Bus [-] 5 Serial Data	(16) I	(16) —
(17) 17	(17) 0.35	(17) BU / WH	(17) 4985	(17) AUTOSAR CAN Bus [+] 5 Serial Data	(17) I	(17) —
18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.35	(19) YE / VT	(19) 2516	(19) Telematics Switch Green LED Indicator Control	(19) I	(19) —
20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.35	(21) BK / BN	(21) 654	(21) Cellular Telephone Microphone Low Reference	(21) I	(21) —
(22) 22	(22) 0.35	(22) BU	(22) 655	(22) Cellular Telephone Microphone Signal	(22) I	(22) —
23 - 25	—	—	—	Not Occupied	—	—
(26) 26	(26) 0.35	(26) BN / WH	(26) 2517	(26) Telematics Switch Red LED Indicator Control	(26) I	(26) —
27	—	—	—	Not Occupied	—	—
(28) 28	(28) 0.35	(28) BN	(28) 7211	(28) Ethernet Bus 4 [+]	(28) II	(28) —
(29) 29	(29) 0.35	(29) GY	(29) 7210	(29) Ethernet Bus 4 [-]	(29) II	(29) —

K73 Telematic Control Module X2



5630760

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340312
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(VT)

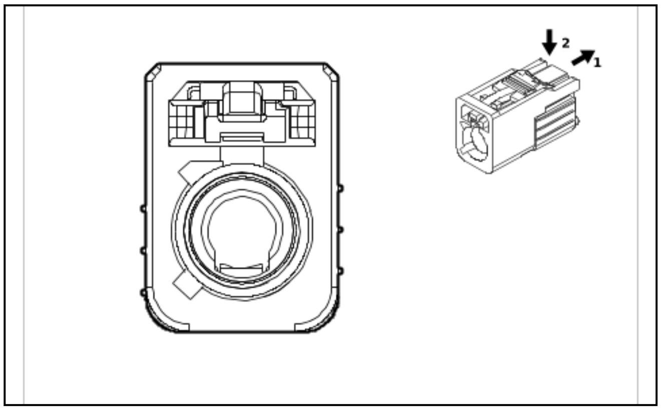
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K73 Telematic Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(Cell only) Coaxial Antenna Cell Phone Signal	I	—

K73 Telematic Control Module X3



5630785

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33340314
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BN)

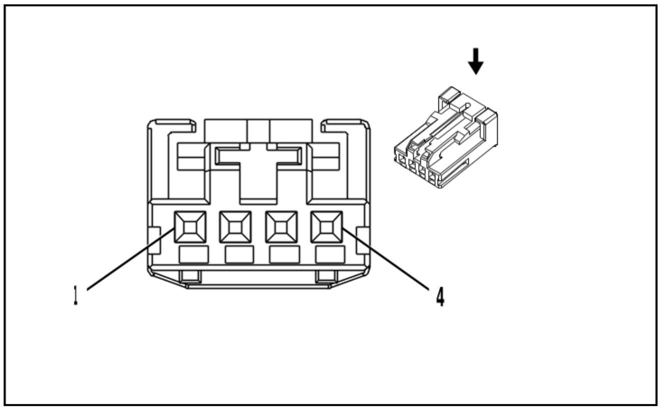
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K73 Telematic Control Module X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(GPS/Cell) Coaxial Antenna Cell/GPS combined Signal	I	—

K77 Remote Function Actuator Module



2717162

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 1-936119-1
- Service Connector: 19332889
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

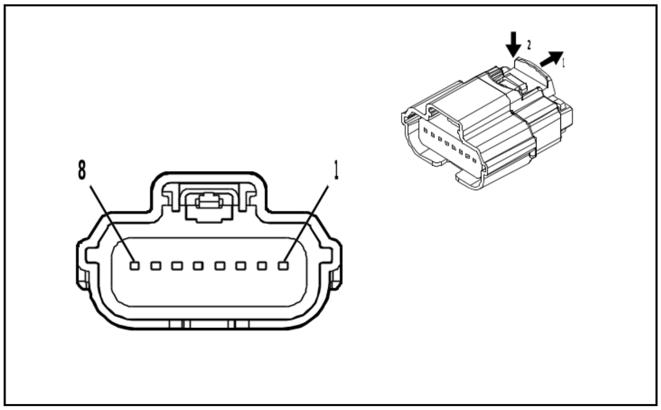
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

K77 Remote Function Actuator Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / VT	(1) 2640	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5 (2) 0.35	(2) GN / YE (2) GN / YE	(2) 2862 (2) 2862	(2) Body Control Module LIN Bus 16 (2) Body Control Module LIN Bus 16	(2) I (2) I	(2) UET (2) - UET
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.75	(4) BK / WH	(4) 1451	(4) Signal Ground	(4) I	(4) —

K85P Restraints Occupant Classification System Module - Passenger



4708234

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 31404-9110
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 64 Series, Sealed(BK)

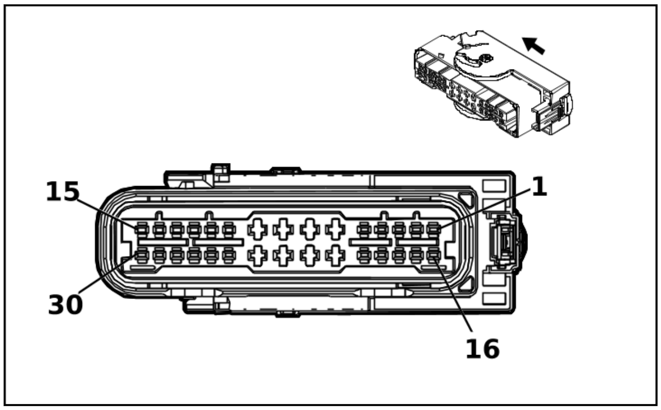
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

K85P Restraints Occupant Classification System Module - Passenger

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / GN	(1) 4440	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU	(2) 4987	(2) AUTOSAR CAN Bus [+] 1 Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU	(3) 4987	(3) AUTOSAR CAN Bus [+] 1 Serial Data	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 4986	(4) AUTOSAR CAN Bus [-] 1 Serial Data	(4) I	(4) —
(5) 5	(5) 0.5	(5) WH	(5) 4986	(5) AUTOSAR CAN Bus [-] 1 Serial Data	(5) I	(5) —
(6) 6	(6) 0.5	(6) BK / WH	(6) 1251	(6) Signal Ground	(6) I	(6) —
(7) 7	(7) 0.5	(7) OG / BN	(7) 3947	(7) Passenger Automatic Locking Retractor Switch Signal	(7) I	(7) —
(8) 8	(8) 0.5	(8) GY / OG	(8) 3946	(8) Passenger Automatic Locking Retractor Switch Low Reference	(8) I	(8) —

K111 Fuel Pump Power Control Module (L5P - N2N)



3240109

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 5-2109446-7
- Service Connector: 86545828
- Description: 30-Way F 1.5, 2.8 MCP Series, Sealed(BK)

Terminal Part Information

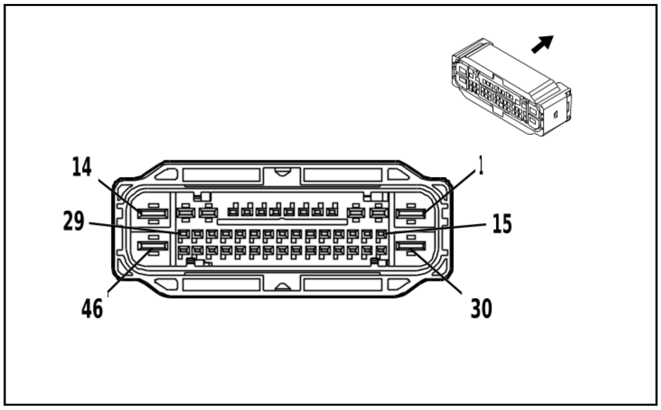
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19329958	J-35616-2A (GY)	J-38125-217
II	19371214	J-35616-35 (VT)	J-38125-556

K111 Fuel Pump Power Control Module (L5P - N2N)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.5	(2) BU / YE	(2) 6861	(2) Water In Fuel Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK / BU	(3) 6863	(3) Water In Fuel Sensor Low Reference	(3) I	(3) —
(4) 4	(4) 0.5	(4) BN / GY	(4) 7072	(4) Fuel Temperature Sensor 1 Signal	(4) I	(4) —
5 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 2.5	(7) RD / VT	(7) 1940	(7) Battery Positive Voltage	(7) II	(7) —
(8) 8	(8) 2.5	(8) GY	(8) 120	(8) Fuel Pump Control	(8) II	(8) —
(9) 9	(9) 2.5	(9) YE / GY	(9) 4137	(9) Fuel Pump Supply Voltage Phase 2	(9) II	(9) —
10 - 11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.5	(12) BN / RD	(12) 7445	(12) Fuel Line Pressure Sensor 5V Reference	(12) I	(12) —
(13) 13	(13) 0.5	(13) BU / GN	(13) 1936	(13) Primary Fuel Level Sensor Signal	(13) I	(13) —
14	—	—	—	Not Occupied	—	—
(15) 15	(15) 0.5	(15) BU / GY	(15) 4054	(15) Private Serial Data Powertrain CAN Bus [-] Serial Data	(15) I	(15) —
(16) 16	(16) 1	(16) VT / GN	(16) 4320	(16) Powertrain Sensor Bus Enable	(16) I	(16) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.5	(18) GN / GY	(18) 465	(18) Fuel Pump Primary Relay Control	(18) I	(18) —
(19) 19	(19) 0.5	(19) BN / WH	(19) 7073	(19) Fuel Temperature Sensor 1 Low Reference	(19) I	(19) —
20 - 21	—	—	—	Not Occupied	—	—
(22) 22	(22) 2.5	(22) BK / WH	(22) 1951	(22) Signal Ground	(22) II	(22) —
(23) 23	(23) 0.5	(23) WH	(23) 7444	(23) Fuel Pump Assembly Shield Ground	(23) II	(23) —
(24) 24	(24) 2.5	(24) WH / BN	(24) 4138	(24) Fuel Pump Supply Voltage Phase 3	(24) II	(24) —
25	—	—	—	Not Occupied	—	—
(26) 26	(26) 0.5	(26) BU / WH	(26) 7446	(26) Fuel Pressure Sensor Signal	(26) I	(26) —
(27) 27	(27) 0.5	(27) BK / YE	(27) 7447	(27) Fuel Pressure Sensor Low Reference	(27) I	(27) —
(28) 28	(28) 0.5	(28) BK / GN	(28) 6281	(28) Fuel Level Sensor Low Reference	(28) I	(28) —
29	—	—	—	Not Occupied	—	—
(30) 30	(30) 0.5	(30) WH	(30) 4055	(30) Private Serial Data Powertrain CAN Bus [+] Serial Data	(30) I	(30) —

K111 Fuel Pump Power Control Module (L5P & N2N)



4162046

Connector Part Information

- Harness Type: Fuel Pump Power Control Module Harness
- OEM Connector: 35492372
- Service Connector: Service by Harness - See Part Catalog
- Description: 46-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(GY)

Terminal Part Information

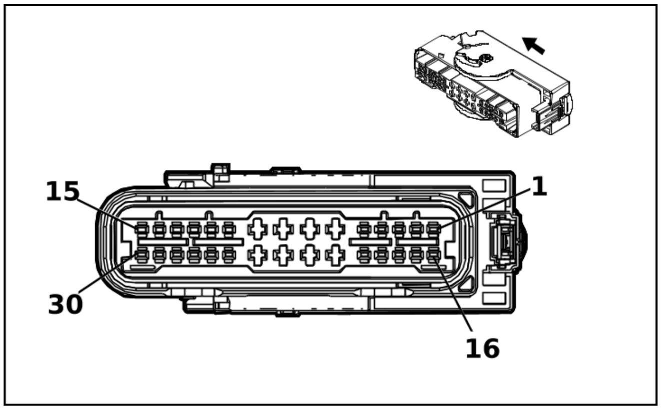
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-35 (VT)	No Tool Required
III	Not required	J-35616-40 (BU)	No Tool Required

K111 Fuel Pump Power Control Module (L5P & N2N)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) WH / BN	(1) 4138	(1) Fuel Pump Supply Voltage Phase 3	(1) III	(1) —
(2) 2	(2) 2.5	(2) GY	(2) 120	(2) Fuel Pump Control	(2) II	(2) —
(3) 3	(3) 0.5	(3) VT / WH	(3) 639	(3) Run/Crank Ignition 1 Voltage	(3) II	(3) —
4 - 5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.75	(6) BU / GN	(6) 11437	(6) Secondary Fuel Pump Disable Signal	(6) I	(6) —
(7) 7	(7) 0.5	(7) WH	(7) 4055	(7) Private Serial Data Powertrain CAN Bus [+] Serial Data	(7) I	(7) —
(8) 8	(8) 0.5	(8) BU / GY	(8) 4054	(8) Private Serial Data Powertrain CAN Bus [-] Serial Data	(8) I	(8) —
9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.75	(10) VT / GN	(10) 4320	(10) Powertrain Sensor Bus Enable	(10) I	(10) —
(11) 11	(11) 0.5	(11) GN / GY	(11) 465	(11) Fuel Pump Primary Relay Control	(11) I	(11) —
12	—	—	—	Not Occupied	—	—
(13) 13	(13) 1	(13) BU / GN	(13) 2120	(13) Secondary Fuel Pump Control	(13) II	(13) —
(14) 14	(14) 2.5	(14) BK / WH	(14) 1951	(14) Signal Ground	(14) III	(14) —
(15) 15	(15) 0.75	(15) WH	(15) 7444	(15) Fuel Pump Assembly Shield Ground	(15) I	(15) —
(16) 16	(16) 0.5	(16) BU / YE	(16) 6861	(16) Water In Fuel Sensor Signal	(16) I	(16) —
17 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.5	(19) BN / RD	(19) 7445	(19) Fuel Line Pressure Sensor 5V Reference	(19) I	(19) —
(20) 20	(20) 0.75	(20) BU / WH	(20) 7446	(20) Fuel Pressure Sensor Signal	(20) I	(20) —
(21) 21	(21) 0.5	(21) BK / GN	(21) 6281	(21) Fuel Level Sensor Low Reference	(21) I	(21) —
(22) 22	(22) 0.5	(22) BK / BU	(22) 6282	(22) Fuel Level Sensor 2 Low Reference	(22) I	(22) —
(23) 23	(23) 0.5	(23) BK / BU	(23) 6863	(23) Water In Fuel Sensor Low Reference	(23) I	(23) —
(24) 24	(24) 0.5	(24) BN / WH	(24) 7073	(24) Fuel Temperature Sensor 1 Low Reference	(24) I	(24) —
25 - 29	—	—	—	Not Occupied	—	—
(30) 30	(30) 2.5	(30) YE / GY	(30) 4137	(30) Fuel Pump Supply Voltage Phase 2	(30) III	(30) —
31 - 34	—	—	—	Not Occupied	—	—
(35) 35	(35) 0.5	(35) BK / YE	(35) 7447	(35) Fuel Pressure Sensor Low Reference	(35) I	(35) —
(36) 36	(36) 0.5	(36) BN / GY	(36) 7072	(36) Fuel Temperature Sensor 1 Signal	(36) I	(36) —
(37) 37	(37) 0.75	(37) BU / GN	(37) 1936	(37) Primary Fuel Level Sensor Signal	(37) I	(37) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(38) 38	(38) 0.5	(38) BU / WH	(38) 1937	(38) Secondary Fuel Level Sensor Signal	(38) I	(38) —
39 - 43	—	—	—	Not Occupied	—	—
(44) 44	(44) 0.75	(44) BK / GN	(44) 1580	(44) Fuel Pump Low Reference	(44) I	(44) —
45	—	—	—	Not Occupied	—	—
(46) 46	(46) 2.5	(46) RD / VT	(46) 1940	(46) Battery Positive Voltage	(46) III	(46) —

K111 Fuel Pump Power Control Module (L8T - FHS)



3240109

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 5-2109446-7
- Service Connector: 86545828
- Description: 30-Way F 1.5, 2.8 MCP Series, Sealed(BK)

Terminal Part Information

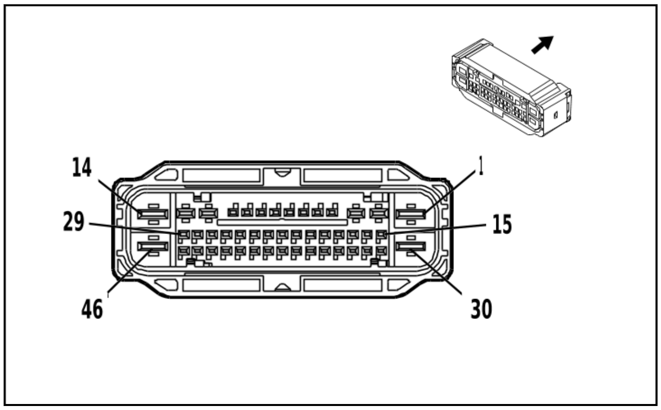
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19329958	J-35616-2A (GY)	J-38125-217
II	19371214	J-35616-35 (VT)	J-38125-556

K111 Fuel Pump Power Control Module (L8T - FHS)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 2.5	(7) RD / VT	(7) 1940	(7) Battery Positive Voltage	(7) II	(7) —
(8) 8	(8) 2.5	(8) GY	(8) 120	(8) Fuel Pump Control	(8) II	(8) —
(9) 9	(9) 2.5	(9) YE / GY	(9) 4137	(9) Fuel Pump Supply Voltage Phase 2	(9) II	(9) —
(10) 10	(10) 0.5	(10) YE / RD	(10) 2709	(10) Fuel Tank Pressure Sensor 5V Reference	(10) I	(10) —
(11) 11	(11) 0.5	(11) BU / GN	(11) 890	(11) Fuel Tank Pressure Sensor Signal	(11) I	(11) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(12) 12	(12) 0.5	(12) BN / RD	(12) 7445	(12) Fuel Line Pressure Sensor 5V Reference	(12) I	(12) —
(13) 13	(13) 0.5	(13) BU / GN	(13) 1936	(13) Primary Fuel Level Sensor Signal	(13) I	(13) —
14	—	—	—	Not Occupied	—	—
(15) 15	(15) 0.5	(15) BU / GY	(15) 4054	(15) Private Serial Data Powertrain CAN Bus [-] Serial Data	(15) I	(15) —
(16) 16	(16) 0.5	(16) VT / GN	(16) 4320	(16) Powertrain Sensor Bus Enable	(16) I	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.5	(18) GN / GY	(18) 465	(18) Fuel Pump Primary Relay Control	(18) I	(18) —
19 - 20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.5	(21) WH	(21) 1310	(21) EVAP Vent Solenoid Valve Control	(21) II	(21) —
(22) 22	(22) 2.5	(22) BK / WH	(22) 1951	(22) Signal Ground	(22) II	(22) —
(23) 23	(23) 0.5	(23) WH	(23) 7444	(23) Fuel Pump Assembly Shield Ground	(23) II	(23) —
(24) 24	(24) 2.5	(24) WH / BN	(24) 4138	(24) Fuel Pump Supply Voltage Phase 3	(24) II	(24) —
(25) 25	(25) 0.5	(25) BK / BN	(25) 6284	(25) Fuel Tank Pressure Sensor Low Reference	(25) I	(25) —
(26) 26	(26) 0.5	(26) BU / WH	(26) 7446	(26) Fuel Pressure Sensor Signal	(26) I	(26) —
(27) 27	(27) 0.5	(27) BK / YE	(27) 7447	(27) Fuel Pressure Sensor Low Reference	(27) I	(27) —
(28) 28	(28) 0.5	(28) BK / GN	(28) 6281	(28) Fuel Level Sensor Low Reference	(28) I	(28) —
29	—	—	—	Not Occupied	—	—
(30) 30	(30) 0.5	(30) WH	(30) 4055	(30) Private Serial Data Powertrain CAN Bus [+] Serial Data	(30) I	(30) —

K111 Fuel Pump Power Control Module (L8T & FHS)



4162046

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13557960
- Service Connector: 85090369
- Description: 46-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(GY)

Terminal Part Information

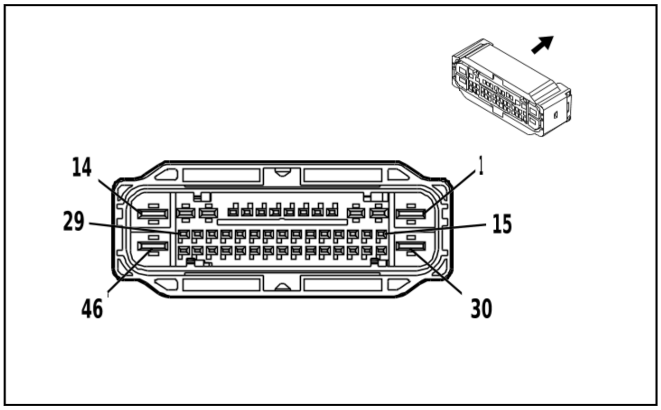
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13575368	J-35616-35 (VT)	J-38125-556
II	19370818	J-35616-12 (BU)	J-38125-553
III	84634921	J-35616-42 (RD)	J-38125-212

K111 Fuel Pump Power Control Module (L8T & FHS)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) WH / BN	(1) 4138	(1) Fuel Pump Supply Voltage Phase 3	(1) III	(1) —
(2) 2	(2) 2.5	(2) GY	(2) 120	(2) Fuel Pump Control	(2) I	(2) —
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) BK / GY	(5) 3802	(5) Fuel Composition Sensor Low Reference	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) WH	(7) 4055	(7) Private Serial Data Powertrain CAN Bus [+] Serial Data	(7) II	(7) —
(8) 8	(8) 0.5	(8) BU / GY	(8) 4054	(8) Private Serial Data Powertrain CAN Bus [-] Serial Data	(8) II	(8) —
9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.5	(10) VT / GN	(10) 4320	(10) Powertrain Sensor Bus Enable	(10) II	(10) —
(11) 11	(11) 0.5	(11) GN / GY	(11) 465	(11) Fuel Pump Primary Relay Control	(11) II	(11) —
12 - 13	—	—	—	Not Occupied	—	—
(14) 14	(14) 2.5	(14) BK / WH	(14) 1951	(14) Signal Ground	(14) III	(14) —
(15) 15	(15) 0.5	(15) WH	(15) 7444	(15) Fuel Pump Assembly Shield Ground	(15) II	(15) —
(16) 16	(16) 0.5	(16) VT / BN	(16) 3803	(16) Fuel Composition Sensor Signal	(16) II	(16) —
17 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.5	(19) BN / RD	(19) 7445	(19) Fuel Line Pressure Sensor 5V Reference	(19) II	(19) —
(20) 20	(20) 0.5	(20) BU / WH	(20) 7446	(20) Fuel Pressure Sensor Signal	(20) II	(20) —
(21) 21	(21) 0.5	(21) BK / GN	(21) 6281	(21) Fuel Level Sensor Low Reference	(21) II	(21) —
22	—	—	—	Not Occupied	—	—
(23) 23	(23) 0.5	(23) BK / BN	(23) 6284	(23) Fuel Tank Pressure Sensor Low Reference	(23) II	(23) —
24 - 29	—	—	—	Not Occupied	—	—
(30) 30	(30) 2.5	(30) YE / GY	(30) 4137	(30) Fuel Pump Supply Voltage Phase 2	(30) III	(30) —
31 - 34	—	—	—	Not Occupied	—	—
(35) 35	(35) 0.5	(35) BK / YE	(35) 7447	(35) Fuel Pressure Sensor Low Reference	(35) II	(35) —
36	—	—	—	Not Occupied	—	—
(37) 37	(37) 0.5	(37) BU / GN	(37) 1936	(37) Primary Fuel Level Sensor Signal	(37) II	(37) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
38	—	—	—	Not Occupied	—	—
(39) 39	(39) 0.5	(39) YE / RD	(39) 2709	(39) Fuel Tank Pressure Sensor 5V Reference	(39) II	(39) —
(40) 40	(40) 0.5	(40) BU / GN	(40) 890	(40) Fuel Tank Pressure Sensor Signal	(40) II	(40) —
41 - 42	—	—	—	Not Occupied	—	—
(43) 43	(43) 0.5	(43) WH	(43) 1310	(43) EVAP Vent Solenoid Valve Control	(43) II	(43) —
44 - 45	—	—	—	Not Occupied	—	—
(46) 46	(46) 2.5	(46) RD / VT	(46) 1940	(46) Battery Positive Voltage	(46) III	(46) —

K111 Fuel Pump Power Control Module (L8T & N2N)



4162046

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 35492372
- Service Connector: 85090369
- Description: 46-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(GY)

Terminal Part Information

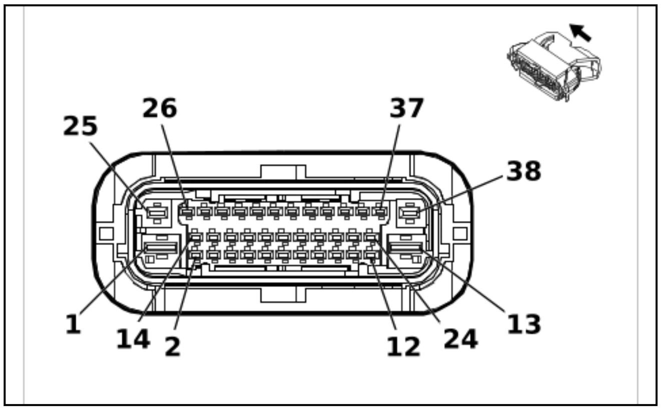
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13575368	J-35616-35 (VT)	J-38125-556
II	19370818	J-35616-12 (BU)	J-38125-553
III	84634921	J-35616-42 (RD)	J-38125-212

K111 Fuel Pump Power Control Module (L8T & N2N)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) WH / BN	(1) 4138	(1) Fuel Pump Supply Voltage Phase 3	(1) III	(1) —
(2) 2	(2) 2.5	(2) GY	(2) 120	(2) Fuel Pump Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) VT / WH	(3) 639	(3) Run/Crank Ignition 1 Voltage	(3) I	(3) —
4 - 5	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(6) 6	(6) 0.5	(6) BU / GN	(6) 11437	(6) Secondary Fuel Pump Disable Signal	(6) II	(6) —
(7) 7	(7) 0.5	(7) WH	(7) 4055	(7) Private Serial Data Powertrain CAN Bus [+] Serial Data	(7) II	(7) —
(8) 8	(8) 0.5	(8) BU / GY	(8) 4054	(8) Private Serial Data Powertrain CAN Bus [-] Serial Data	(8) II	(8) —
9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.5	(10) VT / GN	(10) 4320	(10) Powertrain Sensor Bus Enable	(10) II	(10) —
(11) 11	(11) 0.5	(11) GN / GY	(11) 465	(11) Fuel Pump Primary Relay Control	(11) II	(11) —
(12) 12	(12) 1	(12) BK / GN	(12) 1580	(12) Fuel Pump Low Reference	(12) I	(12) —
(13) 13	(13) 1	(13) BU / GN	(13) 2120	(13) Secondary Fuel Pump Control	(13) I	(13) —
(14) 14	(14) 2.5	(14) BK / WH	(14) 1951	(14) Signal Ground	(14) III	(14) —
(15) 15	(15) 0.5	(15) WH	(15) 7444	(15) Fuel Pump Assembly Shield Ground	(15) II	(15) —
16 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.5	(19) BN / RD	(19) 7445	(19) Fuel Line Pressure Sensor 5V Reference	(19) II	(19) —
(20) 20	(20) 0.5	(20) BU / WH	(20) 7446	(20) Fuel Pressure Sensor Signal	(20) II	(20) —
(21) 21	(21) 0.5	(21) BK / GN	(21) 6281	(21) Fuel Level Sensor Low Reference	(21) II	(21) —
(22) 22	(22) 0.5	(22) BK / BU	(22) 6282	(22) Fuel Level Sensor 2 Low Reference	(22) II	(22) —
(23) 23	(23) 0.5	(23) BK / BN	(23) 6284	(23) Fuel Tank Pressure Sensor Low Reference	(23) II	(23) —
24 - 29	—	—	—	Not Occupied	—	—
(30) 30	(30) 2.5	(30) YE / GY	(30) 4137	(30) Fuel Pump Supply Voltage Phase 2	(30) III	(30) —
31 - 34	—	—	—	Not Occupied	—	—
(35) 35	(35) 0.5	(35) BK / YE	(35) 7447	(35) Fuel Pressure Sensor Low Reference	(35) II	(35) —
36	—	—	—	Not Occupied	—	—
(37) 37	(37) 0.5	(37) BU / GN	(37) 1936	(37) Primary Fuel Level Sensor Signal	(37) II	(37) —
(38) 38	(38) 0.5	(38) BU / WH	(38) 1937	(38) Secondary Fuel Level Sensor Signal	(38) II	(38) —
(39) 39	(39) 0.5	(39) YE / RD	(39) 2709	(39) Fuel Tank Pressure Sensor 5V Reference	(39) II	(39) —
(40) 40	(40) 0.5	(40) BU / GN	(40) 890	(40) Fuel Tank Pressure Sensor Signal	(40) II	(40) —
41 - 42	—	—	—	Not Occupied	—	—
(43) 43	(43) 0.5	(43) WH	(43) 1310	(43) EVAP Vent Solenoid Valve Control	(43) II	(43) —
44 - 45	—	—	—	Not Occupied	—	—
(46) 46	(46) 2.5	(46) RD / VT	(46) 1940	(46) Battery Positive Voltage	(46) III	(46) —

K115 Reductant Control Module (L5P)



3240111

Connector Part Information

- Harness Type: Emission Reduction Fluid Tank Reservoir Wire Harness
- OEM Connector: 35202510
- Service Connector: Service by Harness - See Part Catalog
- Description: 38-Way F 1.5 CTS, 2.8 MCP, 4.8 MCP Series, Sealed(BK with BK Inner Connector)

Terminal Part Information

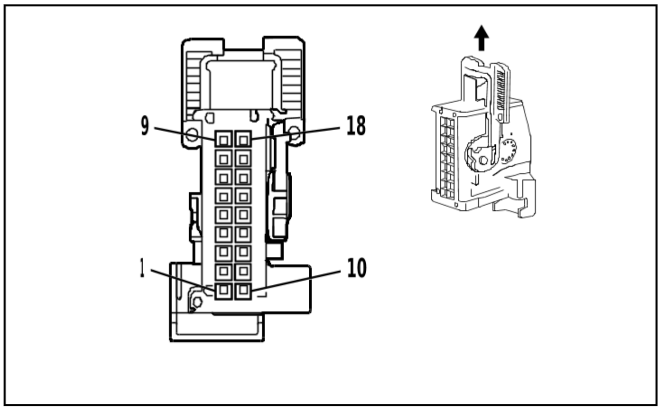
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-40 (BU)	No Tool Required

K115 Reductant Control Module (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 3	(1) RD / WH	(1) 2040	(1) Battery Positive Voltage	(1) II	(1) —
(2) 2	(2) 1	(2) BN	(2) 3676	(2) Diesel Exhaust Fluid Heating Tank 2 Heater Control	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 1	(4) YE	(4) 3677	(4) Diesel Exhaust Fluid Reservoir Heater Control	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.5	(6) BK	(6) 3244	(6) Diesel Exhaust Fluid Tank Temperature Sensor Signal	(6) I	(6) —
(7) 7	(7) 0.5	(7) BK	(7) 7290	(7) Diesel Exhaust Fluid Sensor Voltage Reference 1	(7) I	(7) —
(8) 8	(8) 0.5	(8) YE / GN	(8) 7284	(8) Diesel Exhaust Fluid Liquid Quality Temperature Signal	(8) I	(8) —
(9) 9	(9) 0.5	(9) BK / YE	(9) 8434	(9) Diesel Exhaust Fluid Sensor Low Reference	(9) I	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 1	(11) YE	(11) 3876	(11) Diesel Exhaust Fluid Smart Pump Supply Voltage Phase 3	(11) I	(11) —
12	—	—	—	Not Occupied	—	—
(13) 13	(13) 3	(13) BK / WH	(13) 1151	(13) Signal Ground	(13) II	(13) —
(14) 14	(14) 1	(14) BN	(14) 2936	(14) Diesel Exhaust Fluid Heating Tank 2 Heater Control Low	(14) I	(14) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
15	—	—	—	Not Occupied	—	—
(16) 16	(16) 1	(16) BU	(16) 4318	(16) Diesel Exhaust Fluid Tank Heater Low Control	(16) I	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.5	(18) BN	(18) 3245	(18) Diesel Exhaust Fluid Tank Temperature Sensor Low Reference	(18) I	(18) —
(19) 19	(19) 0.5	(19) BN	(19) 3106	(19) Diesel Exhaust Fluid Pressure Sensor 5 Volt Reference	(19) I	(19) —
(20) 20	(20) 0.5	(20) BU	(20) 3108	(20) Diesel Exhaust Fluid Pressure Sensor Signal	(20) I	(20) —
(21) 21	(21) 0.5	(21) BU	(21) 3107	(21) Diesel Exhaust Fluid Pressure Sensor Low Reference	(21) I	(21) —
22 - 23	—	—	—	Not Occupied	—	—
(24) 24	(24) 1	(24) BN	(24) 3875	(24) Diesel Exhaust Fluid Smart Pump Supply Voltage Phase 2	(24) I	(24) —
25	—	—	—	Not Occupied	—	—
(26) 26	(26) 1	(26) WH	(26) 3199	(26) Diesel Exhaust Fluid Pressure Line Heater Control	(26) I	(26) —
27	—	—	—	Not Occupied	—	—
(28) 28	(28) 1	(28) BN	(28) 4319	(28) Diesel Exhaust Fluid Line Heater Low Control	(28) I	(28) —
29	—	—	—	Not Occupied	—	—
(30) 30	(30) 0.5	(30) VT / WH	(30) 639	(30) Run/Crank Ignition 1 Voltage	(30) I	(30) —
(31) 31	(31) 0.5	(31) BU	(31) 4977	(31) AUTOSAR CAN Bus [+] 3 Serial Data	(31) I	(31) —
(32) 32	(32) 0.5	(32) BU	(32) 4977	(32) AUTOSAR CAN Bus [+] 3 Serial Data	(32) I	(32) —
(33) 33	(33) 0.5	(33) BN	(33) 4976	(33) AUTOSAR CAN Bus [-] 3 Serial Data	(33) I	(33) —
(34) 34	(34) 0.5	(34) BN	(34) 4976	(34) AUTOSAR CAN Bus [-] 3 Serial Data	(34) I	(34) —
35	—	—	—	Not Occupied	—	—
(36) 36	(36) 1 (36) 1	(36) BK (36) BU	(36) 2937 (36) 2937	(36) Diesel Exhaust Fluid Pump Motor Stator Low Reference (36) Diesel Exhaust Fluid Pump Motor Stator Low Reference	(36) I (36) I	(36) CHASSIS CAB (36) PICKUP
(37) 37	(37) 1	(37) WH	(37) 3103	(37) Diesel Exhaust Fluid Smart Pump Control	(37) I	(37) —
(38) 38	(38) 2	(38) RD / GN	(38) 2440	(38) Battery Positive Voltage	(38) I	(38) —

K157 Video Processing Module X1



1567082

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 10820547
- Service Connector: 84976200
- Description: 18-Way F Micro-Quadlock Series(BK)

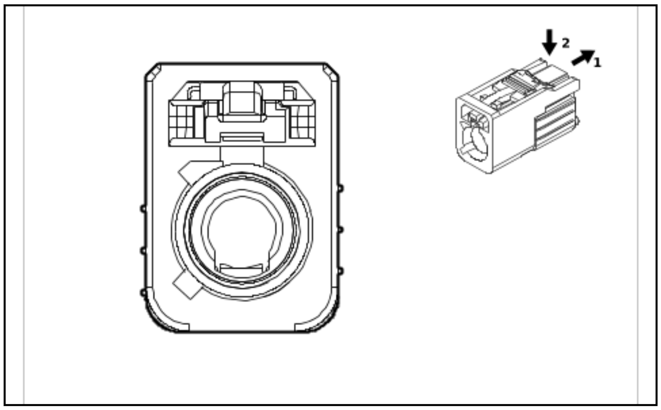
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19300632	J-35616-64B (L-BU)	J-38125-215A

K157 Video Processing Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.75	(3) BK / WH	(3) 1451	(3) Signal Ground	(3) I	(3) —
4 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.5	(10) RD / VT	(10) 1640	(10) Battery Positive Voltage	(10) I	(10) —
11 - 12	—	—	—	Not Occupied	—	—
(13) 13	(13) 0.5	(13) WH	(13) 4986	(13) AUTOSAR CAN Bus [-] 1 Serial Data	(13) I	(13) —
(14) 14	(14) 0.5	(14) WH	(14) 4986	(14) AUTOSAR CAN Bus [-] 1 Serial Data	(14) I	(14) —
(15) 15	(15) 0.5	(15) BU	(15) 4987	(15) AUTOSAR CAN Bus [+] 1 Serial Data	(15) I	(15) —
(16) 16	(16) 0.5	(16) BU	(16) 4987	(16) AUTOSAR CAN Bus [+] 1 Serial Data	(16) I	(16) —
17 - 18	—	—	—	Not Occupied	—	—

K157 Video Processing Module X3



5630785

Connector Part Information
- Harness Type: Body Wiring Harness COAX
- OEM Connector: 33340314
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BN)

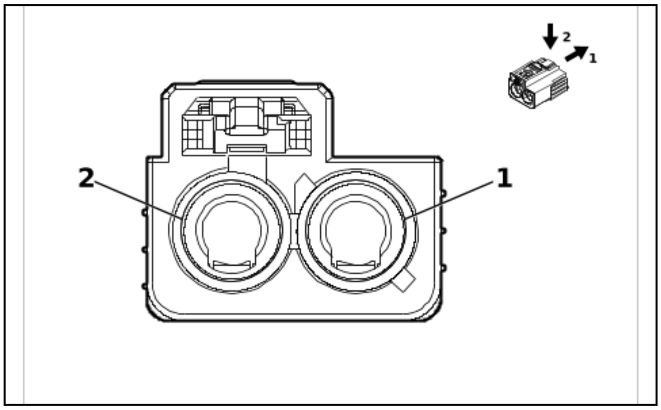
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K157 Video Processing Module X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Video Processing Module Coaxial Video Signal	I	—

K157 Video Processing Module X4



5810836

Connector Part Information
- Harness Type: Body Wiring Harness COAX
- OEM Connector: 33340386
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 2-Way F Coax Type(BG)

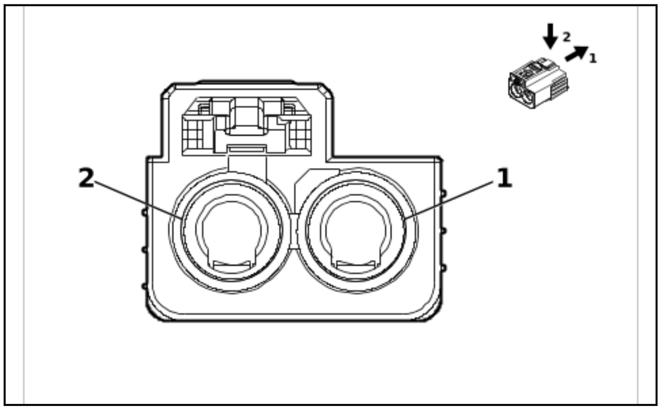
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K157 Video Processing Module X4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Cargo Bed Rear Vision Camera Coaxial Video Signal	I	—

K157 Video Processing Module X5



5810827

Connector Part Information

- Harness Type: Body Wiring Harness COAX
- OEM Connector: 33340382
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 2-Way F Coax Type(GN)

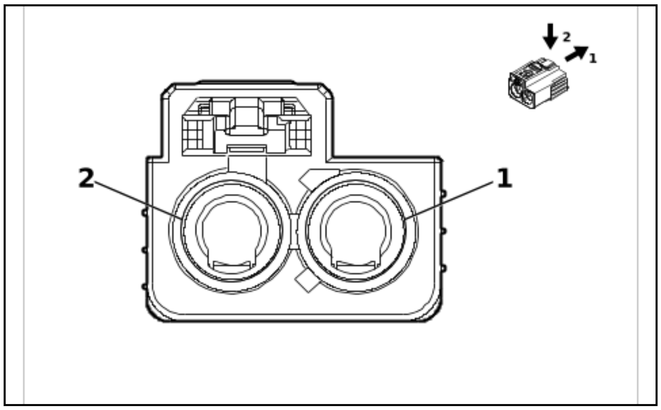
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K157 Video Processing Module X5

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Video Processing Module Coaxial Video Signal	I	—

K157 Video Processing Module X6



5810832

Connector Part Information
- Harness Type: Body Wiring Harness TWINAX
- OEM Connector: 33340383
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 2-Way F Coax Type(BN)

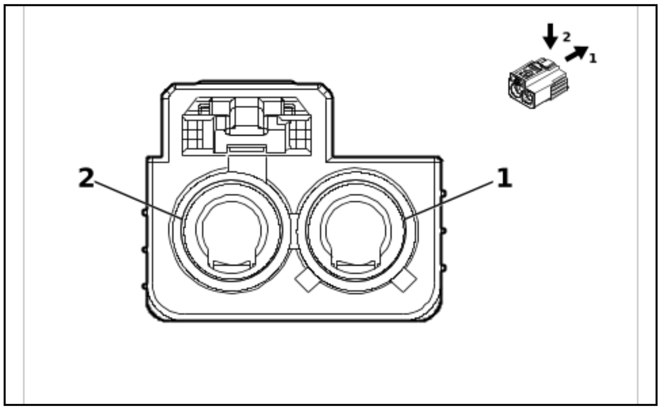
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K157 Video Processing Module X6

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) Coax Cable	(1) 4724	(1) Right Sideview Camera LVDS (Low Voltage Differential Signaling) Coaxial Signal	(1) I	(1) —
(2) 2	(2) —	(2) Coax Cable	(2) 4725	(2) Left Sideview Camera LVDS (Low Voltage Differential Signaling) Coaxial Signal	(2) I	(2) —

K157 Video Processing Module X7



5810835

Connector Part Information
- Harness Type: Body Wiring Harness COAX
- OEM Connector: 33340387
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 2-Way F Coax Type(CU)

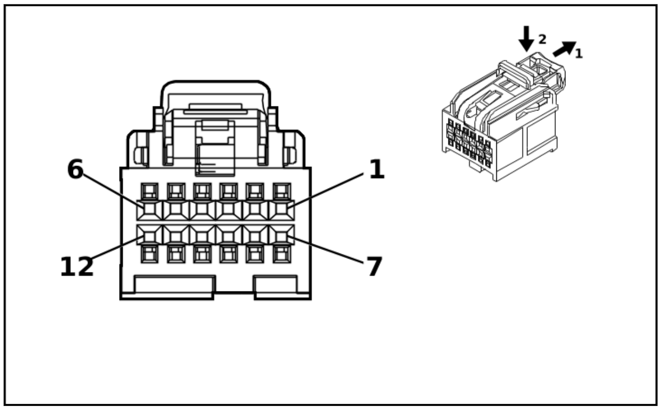
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

K157 Video Processing Module X7

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Video Processing Module Coaxial Video Signal	I	—

K182 Parking Assist Control Module X1 (UD5)



4975223

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35016616
- Service Connector: 13519750
- Description: 12-Way F 0.64 OCS Series(BK)

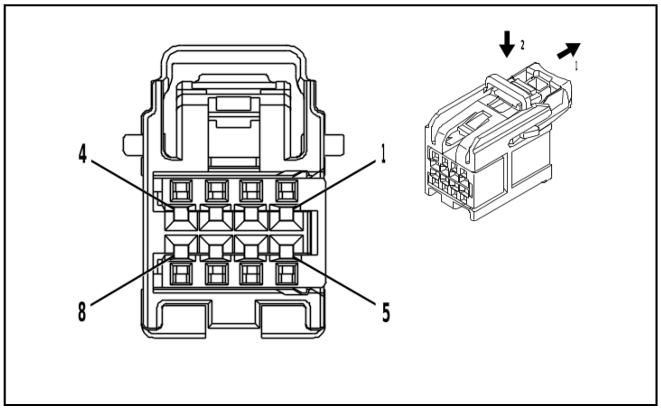
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19354230	J-35616-64B (L-BU)	J-38125-215A

K182 Parking Assist Control Module X1 (UD5)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / WH	(1) 4740	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH	(2) 4986	(2) AUTOSAR CAN Bus [-] 1 Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU	(3) 4987	(3) AUTOSAR CAN Bus [+] 1 Serial Data	(3) I	(3) —
4 - 5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.5	(6) BK / WH	(6) 1551	(6) Signal Ground	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.5	(8) WH	(8) 4986	(8) AUTOSAR CAN Bus [-] 1 Serial Data	(8) I	(8) —
(9) 9	(9) 0.5	(9) BU	(9) 4987	(9) AUTOSAR CAN Bus [+] 1 Serial Data	(9) I	(9) —
10 - 12	—	—	—	Not Occupied	—	—

K182 Parking Assist Control Module X2 (UD5)



4232228

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 15526973
- Service Connector: 19353873
- Description: 8-Way F 0.64 OCS Series(GY)

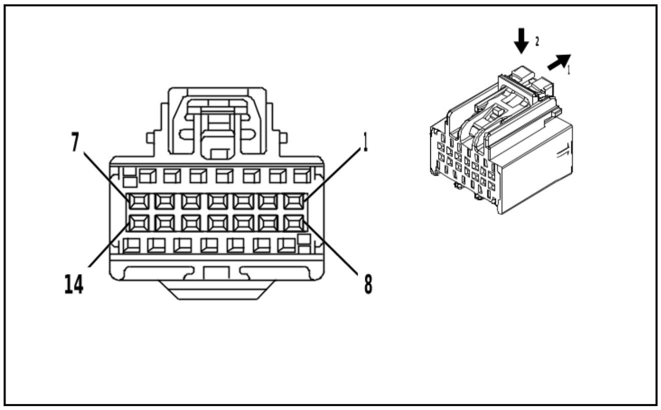
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

K182 Parking Assist Control Module X2 (UD5)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.5	(2) YE / WH	(2) 2377	(2) Right Rear Middle Parking Assist Sensor Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE	(3) 2375	(3) Left Rear Outer Parking Assist Sensor Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BN / WH	(4) 2374	(4) Object Sensor Voltage Reference	(4) I	(4) —
(5) 5	(5) 0.5	(5) YE / VT	(5) 2378	(5) Right Rear Outer Parking Assist Sensor Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) YE / BU	(6) 2376	(6) Left Rear Middle Parking Assist Sensor Signal	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.5	(8) BK / GY	(8) 2379	(8) Object Sensor Low Reference	(8) I	(8) —

K182 Parking Assist Control Module X3 (UD5)



4547098

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 7289-2897-90
- Service Connector: 19354933
- Description: 14-Way F 0.64 Kaizen Series(BU)

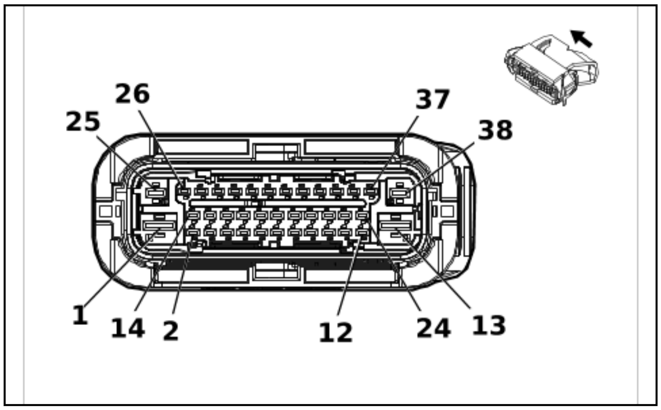
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19303553	J-35616-64B (L-BU)	J-38125-215A

K182 Parking Assist Control Module X3 (UD5)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) YE / GY	(5) 5216	(5) Left Front Middle Parking Assist Sensor	(5) I	(5) —
(6) 6	(6) 0.5	(6) WH / GY	(6) 5217	(6) Right Front Outer Parking Assist Sensor	(6) I	(6) —
(7) 7	(7) 0.5	(7) BN	(7) 6581	(7) Front Parking Assist Display Control	(7) I	(7) —
8 - 10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.5	(11) VT / WH	(11) 5215	(11) Left Front Outer Parking Assist Sensor	(11) I	(11) —
(12) 12	(12) 0.5	(12) VT / GY	(12) 5218	(12) Right Front Middle Parking Assist Sensor	(12) I	(12) —
13	—	—	—	Not Occupied	—	—
(14) 14	(14) 0.5	(14) BK / BU	(14) 5214	(14) Front Parking Assist Sensor Low Reference	(14) I	(14) —

K194 Rear Gate Module



3240112

Connector Part Information
- Harness Type: Endgate Wiring Harness
- OEM Connector: 35503407
- Service Connector: Service by Harness - See Part Catalog
- Description: 38-Way F 1.5 CTS, 2.8 MCP, 4.8 MCP Series, Sealed(BK with BU Inner Connector)

Terminal Part Information

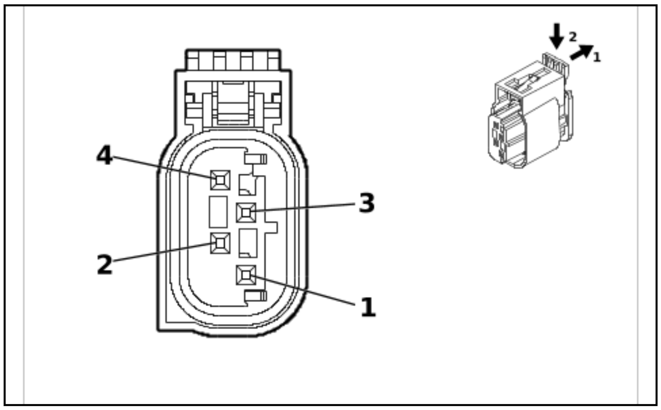
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-35 (VT)	No Tool Required
III	Not required	J-35616-40 (BU)	No Tool Required

K194 Rear Gate Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) BK	(1) 1850	(1) Ground	(1) III	(1) —
(2) 2	(2) 0.5	(2) WH	(2) 4100	(2) AUTOSAR CAN Bus [-] 4 Serial Data	(2) I	(2) —
(3) 3	(3) 0.5	(3) WH	(3) 4100	(3) AUTOSAR CAN Bus [-] 4 Serial Data	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) YE / BK	(5) 8085	(5) Rear Closure Latch Primary Status	(5) I	(5) —
(6) 6	(6) 0.5	(6) BN / GY	(6) 10281	(6) Rear Closure Latch Secondary Status Signal	(6) I	(6) —
(7) 7	(7) 0.5	(7) WH / GN	(7) 8084	(7) Rear Closure Latch Neutral Status	(7) I	(7) —
(8) 8	(8) 0.5	(8) GY / VT	(8) 4678	(8) Rear Closure Latch Unlatch Status	(8) I	(8) —
9 - 12	—	—	—	Not Occupied	—	—
(13) 13	(13) 2.5	(13) RD / VT	(13) 4442	(13) Primary Fused Battery Positive Voltage	(13) III	(13) —
(14) 14	(14) 0.5	(14) BU / VT	(14) 4101	(14) AUTOSAR CAN Bus [+] 4 Serial Data	(14) I	(14) —
(15) 15	(15) 0.5	(15) BU / VT	(15) 4101	(15) AUTOSAR CAN Bus [+] 4 Serial Data	(15) I	(15) —
(16) 16	(16) 0.5	(16) BN	(16) 7736	(16) Rear Closure Latch 2 Unlatch Status Signal	(16) I	(16) —
17	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(18) 18	(18) 0.5	(18) BN / RD	(18) 4683	(18) Rear Closure Position Sensor Voltage Reference	(18) I	(18) —
(19) 19	(19) 0.5	(19) BK / GN	(19) 4687	(19) Rear Closure Position Sensor Low Reference	(19) I	(19) —
(20) 20	(20) 0.5	(20) BU / VT	(20) 4101	(20) AUTOSAR CAN Bus [+] 4 Serial Data	(20) I	(20) —
(21) 21	(21) 0.5	(21) BN / YE	(21) 4686	(21) Rear Closure Position Sensor Signal 2	(21) I	(21) —
(22) 22	(22) 0.5	(22) BU / WH	(22) 4685	(22) Rear Closure Position Sensor Signal 1	(22) I	(22) —
(23) 23	(23) 0.5	(23) GN / BU	(23) 10283	(23) Rear Closure Latch 2 Primary Status Signal	(23) I	(23) —
(24) 24	(24) 0.5	(24) VT / WH	(24) 10284	(24) Rear Closure Latch 2 Secondary Status Signal	(24) I	(24) —
(25) 25	(25) 1	(25) BN / WH	(25) 4690	(25) Rear Closure Open/Close Motor Close Control	(25) II	(25) —
(26) 26	(26) 0.5	(26) BU / BN	(26) 10282	(26) Rear Closure Latch 2 Neutral Status Signal	(26) I	(26) —
(27) 27	(27) 0.5	(27) GY / BK	(27) 1575	(27) Rear Closure Sensor Low Reference 2	(27) I	(27) —
(28) 28	(28) 0.5	(28) BK / VT	(28) 4656	(28) Rear Closure Object Sensor Low Reference	(28) I	(28) —
29	—	—	—	Not Occupied	—	—
(30) 30	(30) 1	(30) BU	(30) 1509	(30) Rear Closure Cinch Latch Motor 2 Release Control	(30) I	(30) —
(31) 31	(31) 1	(31) GN	(31) 1499	(31) Rear Closure Cinch Latch Motor 2 Cinch Control	(31) I	(31) —
(32) 32	(32) 0.5	(32) WH	(32) 4100	(32) AUTOSAR CAN Bus [-] 4 Serial Data	(32) I	(32) —
(33) 33	(33) 1	(33) BU / GY	(33) 4682	(33) Rear Closure Cinch Latch Motor Release Control	(33) I	(33) —
(34) 34	(34) 1	(34) BN	(34) 4681	(34) Rear Closure Cinch Latch Motor Cinch Control	(34) I	(34) —
(35) 35	(35) 0.5	(35) GN	(35) 1577	(35) Rear Closure Clutch Control	(35) I	(35) —
(36) 36	(36) 0.5	(36) BU / BK	(36) 1590	(36) Rear Closure Clutch Low Return	(36) I	(36) —
37	—	—	—	Not Occupied	—	—
(38) 38	(38) 1	(38) WH	(38) 4689	(38) Rear Closure Open/Close Motor Open Control	(38) II	(38) —

K214 Trailer Tire Pressure Indicator Module



5215490

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13655424
- Service Connector: 86825461
- Description: 4-Way F 0.64 MTS Series, Sealed(BK)

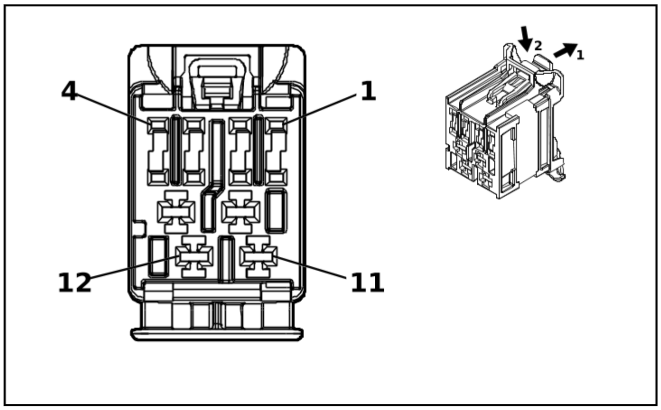
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

K214 Trailer Tire Pressure Indicator Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / GN	(1) 6940	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN / YE	(3) 2862	(3) Body Control Module LIN Bus 16	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

K219 Lighting Control Module X1



5203784

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 160026-0003
- Service Connector: 13509990
- Description: 12-Way F 1.2, 2.8 stAK50h Series(L-PU)

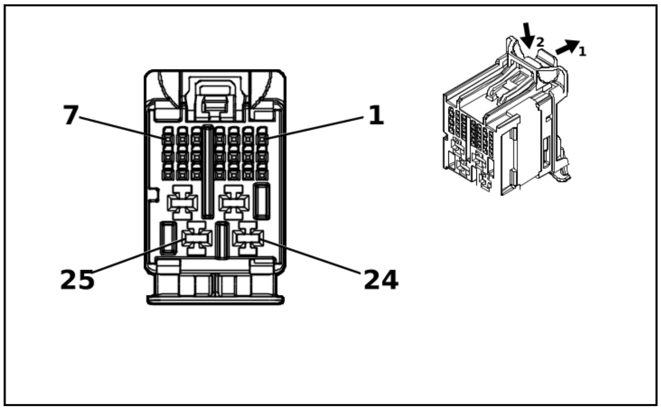
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A
II	87814662	J-35616-35 (VT)	J-38125-557

K219 Lighting Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / YE	(1) 1254	(1) Left Front Park Lamp Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) GN / WH	(3) 24	(3) Backup Lamp Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) BU / WH	(5) 1314	(5) Left Front Turn Signal Lamp Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) BN / GY	(6) 5061	(6) Left Front Fog Lamp Control	(6) I	(6) —
(7) 7	(7) 0.5	(7) GN / YE	(7) 6846	(7) Rear License Plate Lamp Control	(7) I	(7) —
(8) 8	(8) 0.35	(8) GY / BU	(8) 7538	(8) Left Front DRL Control	(8) I	(8) —
(9) 9	(9) 0.5	(9) RD / VT	(9) 7140	(9) Battery Positive Voltage	(9) II	(9) —
(10) 10	(10) 0.5	(10) YE	(10) 712	(10) Left Headlamp Low Beam Control	(10) II	(10) —
11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.5	(12) WH	(12) 711	(12) Left Headlamp High Beam Control	(12) II	(12) —

K219 Lighting Control Module X2



5203807

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 160027-0012
- Service Connector: 13534966
- Description: 25-Way F 0.5 MQS, 2.8 MCP Series(GY with GY Inner Connector)

Terminal Part Information

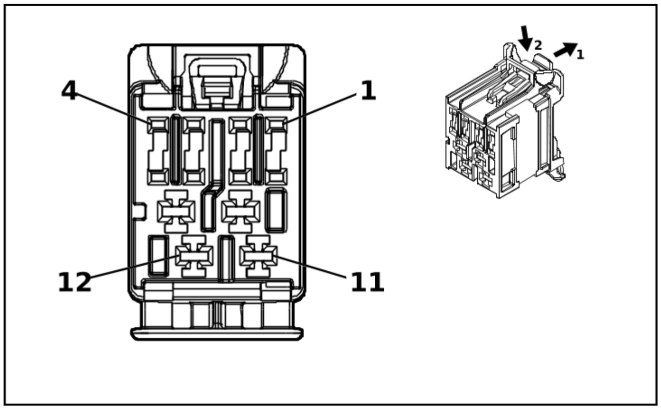
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19370262	EL-35616-58 (BK)	EL-38125-58
II	87814662	J-35616-35 (VT)	J-38125-557

K219 Lighting Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.35	(2) WH / YE	(2) 7541	(2) Right Rear Stop Lamp Control	(2) I	(2) —
(3) 3	(3) 0.35	(3) BN / GY	(3) 2268	(3) Windshield Washer Relay Control	(3) I	(3) —
(4) 4	(4) 0.35	(4) BU / BN	(4) 38	(4) Backup Lamp Relay Control	(4) I	(4) —
5 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.35	(10) BN / GN	(10) 196	(10) Windshield Wiper Motor Park Switch Signal	(10) I	(10) —
(11) 11	(11) 0.35	(11) VT / BK	(11) 6568	(11) Front Turn Signal Lamp Feedback Signal	(11) I	(11) —
(12) 12	(12) 0.35	(12) GY	(12) 91	(12) Windshield Wiper Motor Relay Coil Control	(12) I	(12) —
(13) 13	(13) 0.35	(13) BU / YE	(13) 68	(13) Low Coolant Level Indicator Control	(13) I	(13) —
(14) 14	(14) 0.35	(14) VT	(14) 185	(14) Low Washer Fluid Indicator Control	(14) I	(14) —
15 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.35	(19) WH / BN	(19) 7055	(19) Auxiliary Park Lamp Relay Control	(19) I	(19) —
(20) 20	(20) 0.35	(20) WH / YE	(20) 7545	(20) Right Front Turn Signal Lamp Feedback Signal	(20) I	(20) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(21) 21	(21) 0.35	(21) WH / VT	(21) 860	(21) Windshield Wiper Switch High Signal	(21) I	(21) —
(22) 22	(22) 0.5	(22) RD / GN	(22) 7740	(22) Battery Positive Voltage	(22) II	(22) —
(23) 23	(23) 0.5	(23) RD / BU	(23) 840	(23) Battery Positive Voltage	(23) II	(23) —
24 - 25	—	—	—	Not Occupied	—	—

K219 Lighting Control Module X3



5203797

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 160026-0002
- Service Connector: 13509989
- Description: 12-Way F 1.2, 2.8 stAK50h Series(GN)

Terminal Part Information

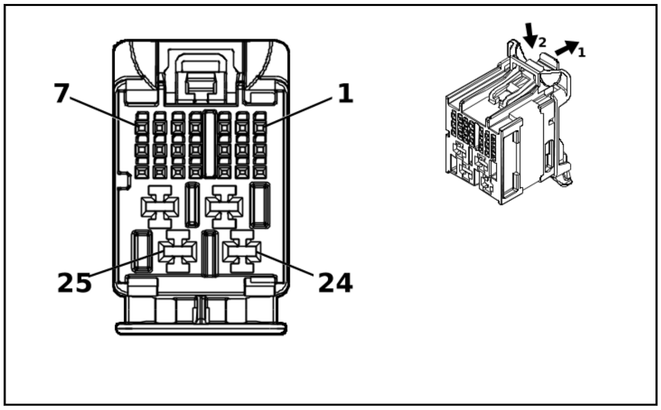
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A
II	87814662	J-35616-35 (VT)	J-38125-557

K219 Lighting Control Module X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BU / BN	(1) 7539	(1) Right Front DRL Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) GY / YE	(2) 7542	(2) Left Rear Stop Lamp Control	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.5	(4) BU / GN	(4) 1253	(4) Right Front Park Lamp Control	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.75	(6) BU / VT	(6) 1335	(6) Right Rear Turn Signal Lamp Control 2	(6) I	(6) —
(7) 7	(7) 0.35	(7) BU / YE	(7) 7761	(7) Backup Illumination Lamp Control	(7) I	(7) —
8	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(9) 9	(9) 1.5	(9) RD / BU	(9) 540	(9) Battery Positive Voltage	(9) II	(9) —
(10) 10	(10) 1.5	(10) RD / BN	(10) 1440	(10) Battery Positive Voltage	(10) II	(10) —
(11) 11	(11) 0.5	(11) WH	(11) 311	(11) Right Headlamp High Beam Control	(11) II	(11) —
(12) 12	(12) 0.5	(12) YE	(12) 312	(12) Right Headlamp Low Beam Control	(12) II	(12) —

K219 Lighting Control Module X4



5203416

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 160027-0015
- Service Connector: 13534969
- Description: 25-Way F 0.5 MQS, 2.8 MCP Series(PU with GY Inner Connector)

Terminal Part Information

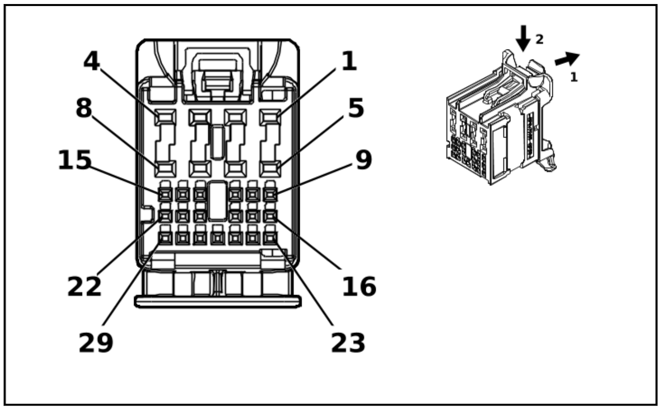
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19370262	EL-35616-58 (BK)	EL-38125-58
II	87814662	J-35616-35 (VT)	J-38125-557

K219 Lighting Control Module X4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1 - 2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) BU / YE	(3) 4979	(3) AUTOSAR CAN Bus [+] 2 Serial Data	(3) I	(3) —
(4) 4	(4) 0.35	(4) WH	(4) 4978	(4) AUTOSAR CAN Bus [-] 2 Serial Data	(4) I	(4) —
(5) 5	(5) 0.35	(5) BU / YE	(5) 4979	(5) AUTOSAR CAN Bus [+] 2 Serial Data	(5) I	(5) —
(6) 6	(6) 0.35	(6) WH	(6) 4978	(6) AUTOSAR CAN Bus [-] 2 Serial Data	(6) I	(6) —
(7) 7	(7) 0.35	(7) WH / BU	(7) 6311	(7) Cruise/ETC/TCC Brake Signal	(7) I	(7) —
8 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.35	(10) WH	(10) 4978	(10) AUTOSAR CAN Bus [-] 2 Serial Data	(10) I	(10) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(11) 11	(11) 0.35	(11) BU / YE	(11) 4979	(11) AUTOSAR CAN Bus [+] 2 Serial Data	(11) I	(11) —
12 - 21	—	—	—	Not Occupied	—	—
(22) 22	(22) 1	(22) RD / BN	(22) 1140	(22) Battery Positive Voltage	(22) II	(22) —
(23) 23	(23) 1.5	(23) BK / WH	(23) 1551	(23) Signal Ground	(23) II	(23) —
(24) 24	(24) 0.5	(24) RD / GN	(24) 1540	(24) Battery Positive Voltage	(24) II	(24) —
(25) 25	(25) 1	(25) BK / WH	(25) 1451	(25) Signal Ground	(25) II	(25) —

K219 Lighting Control Module X5



5203373

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 160029-0013
- Service Connector: 13534975
- Description: 29-Way F 0.5 NANO, 1.2 MCON, stAK50h Series(BU with GY Inner Connector)

Terminal Part Information

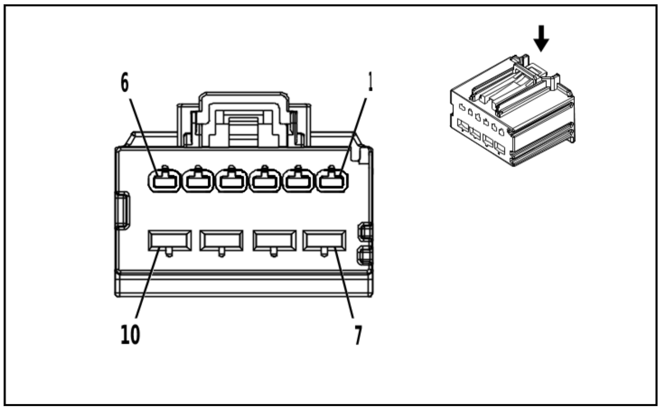
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84729890	J-35616-12 (BU)	J-38125-215A

K219 Lighting Control Module X5

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / GN	(1) 5966	(1) Approach Lamp Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) BN / GY	(2) 6995	(2) Right Rear Park Lamp Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) GY / BU	(3) 7762	(3) Cargo Lamp Control	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH / VT	(4) 1430	(4) Exterior Courtesy Lamp Control	(4) I	(4) —
(5) 5	(5) 0.5	(5) YE / GN	(5) 2024	(5) Animation Lighting Control	(5) I	(5) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(6) 6	(6) 0.75	(6) BN / BU	(6) 6993	(6) Left Rear Park Lamp Control	(6) I	(6) —
(7) 7	(7) 0.5	(7) GN / VT	(7) 1315	(7) Right Front Turn Signal Lamp Control	(7) I	(7) —
(8) 8	(8) 0.75	(8) BU / WH	(8) 1334	(8) Left Rear Turn Signal Lamp Control 2	(8) I	(8) —
(9) 9	(9) 0.35	(9) GN / GY	(9) 2115	(9) Right Turn Signal Lamp Control 2	(9) I	(9) —
(10) 10	(10) 0.35	(10) WH / GY	(10) 2114	(10) Left Turn Signal Lamp Control 2	(10) I	(10) —
(11) 11	(11) 0.35	(11) GY	(11) 1715	(11) Windshield Wiper Switch High Signal	(11) I	(11) —
(13) 13	(13) 0.35	(13) GN / BN	(13) 319	(13) Right Rear Trailer Stop/Turn Lamp Control	(13) I	(13) —
14	—	—	—	Not Occupied	—	—
(15) 15	(15) 0.35	(15) WH / GY	(15) 2935	(15) Task Lamp Switch Signal	(15) I	(15) —
(16) 16	(16) 0.35	(16) YE / WH	(16) 2934	(16) Task Lamp Control Right	(16) I	(16) —
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.35	(18) VT / WH	(18) 239	(18) Run/Crank Ignition 1 Voltage	(18) I	(18) —
20 - 22	—	—	—	Not Occupied	—	—
(23) 23	(23) 0.35	(23) WH / VT	(23) 6567	(23) Rear Turn Signal Lamp Feedback Signal	(23) I	(23) —
(24) 24	(24) 0.35	(24) WH / BK	(24) 7544	(24) Right Rear Turn Signal Lamp Feedback Signal	(24) I	(24) —
(25) 25	(25) 0.35	(25) BN / YE	(25) 820	(25) Center High Mounted Stop Lamp Supply Voltage	(25) I	(25) —
26 - 27	—	—	—	Not Occupied	—	—
(28) 28	(28) 0.35	(28) YE / GY	(28) 2933	(28) Task Lamp Control Left	(28) I	(28) —
(29) 29	(29) 0.35	(29) YE / BU	(29) 318	(29) Left Rear Trailer Stop/Turn Lamp Control	(29) I	(29) —

K234 Rear Seat Heater Vent Control Module X1 (KA6)



3791446

Connector Part Information

- Harness Type: Rear Seat Heater Control Wiring Harness
- OEM Connector: 31372-1000
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 1.5, 2.8 MX Series(BK)

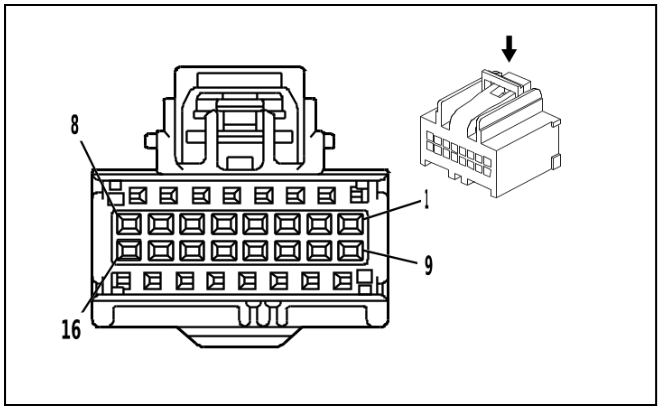
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

K234 Rear Seat Heater Vent Control Module X1 (KA6)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.75	(2) GN / BN	(2) 2296	(2) Right Rear Seat Cushion Heating Element Control	(2) I	(2) —
(3) 3	(3) 0.75	(3) GN / BK	(3) 2297	(3) Right Rear Seat Cushion Heating Element Low Reference	(3) I	(3) —
(4) 4	(4) 0.75	(4) BN / BK	(4) 2295	(4) Left Rear Seat Cushion Heating Element Low Reference	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.75	(6) GY	(6) 2294	(6) Left Rear Seat Cushion Heating Element Control	(6) I	(6) —
(7) 7	(7) 0.75	(7) RD / YE	(7) 5740	(7) Battery Positive Voltage	(7) II	(7) —
(8) 8	(8) 1	(8) BK	(8) 1150	(8) Ground	(8) II	(8) —
9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.75	(10) RD / VT	(10) 6740	(10) Battery Positive Voltage	(10) II	(10) —

K234 Rear Seat Heater Vent Control Module X2 (KA6)



1653409

Connector Part Information
- Harness Type: Rear Seat Heater Control Wiring Harness
- OEM Connector: 7283-9076-30
- Service Connector: Service by Harness - See Part Catalog
- Description: 16-Way F 0.64 Kaizen Series(BK)

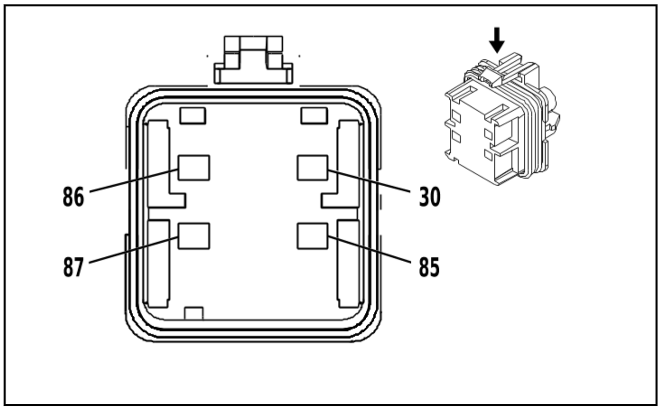
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

K234 Rear Seat Heater Vent Control Module X2 (KA6)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / WH	(1) 7048	(1) Left Rear Cushion Thermistor Feedback Signal	(1) I	(1) —
(2) 2	(2) 0.75	(2) WH / BK	(2) 7054	(2) Right Rear Cushion Thermistor Feedback Signal	(2) I	(2) —
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.75	(5) YE / WH	(5) 7053	(5) Right Rear Seat Cushion Temperature Sensor Signal	(5) I	(5) —
(6) 6	(6) 0.75	(6) WH / BU	(6) 7047	(6) Left Rear Seat Cushion Temperature Sensor Signal	(6) I	(6) —
(7) 7	(7) 0.5	(7) BK	(7) 1150	(7) Ground	(7) I	(7) —
(8) 8	(8) 0.5	(8) GN / BU	(8) 6133	(8) Body Control Module LIN Bus 2	(8) I	(8) —
9 - 16	—	—	—	Not Occupied	—	—

KR81A Auxiliary Battery Relay 1



535912

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 12129716
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 280 Metri-Pack Flexlock Series, Sealed(GY)

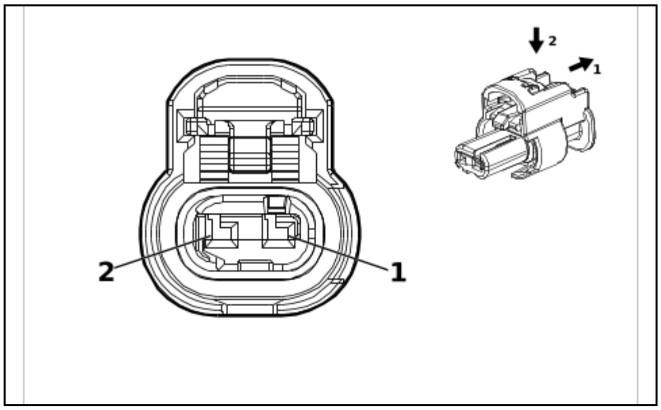
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

KR81A Auxiliary Battery Relay 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(30) 30	(30) 0.5	(30) RD / YE	(30) 4540	(30) Battery Positive Voltage	(30) I	(30) K4Z
(85) 85	(85) 0.5 (85) 1	(85) BK (85) BK	(85) 4450 (85) 4450	(85) Ground (85) Ground	(85) I (85) I	(85) K4Z (85) K4Z
(86) 86	(86) 0.5	(86) VT / BN	(86) 300	(86) Run Ignition 3 Voltage	(86) I	(86) K4Z
(87) 87	(87) 0.5	(87) RD / BU	(87) 4540	(87) Battery Positive Voltage	(87) I	(87) K4Z

KR81B Auxiliary Battery Relay 2



4649903

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 13512365
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

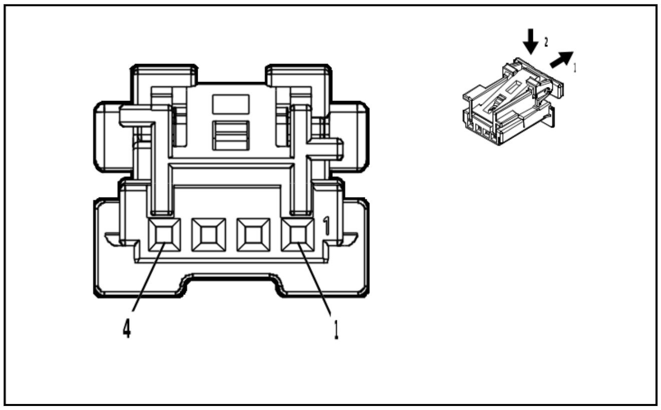
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

KR81B Auxiliary Battery Relay 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / BU	(1) 4540	(1) Battery Positive Voltage	(1) I	(1) K4Z
(2) 2	(2) 0.5 (2) 1	(2) BK (2) BK	(2) 4450 (2) 4450	(2) Ground (2) Ground	(2) I (2) I	(2) K4Z (2) K4Z

M4P Programmable Air Inlet Valve Actuator



4997407

Connector Part Information

- Harness Type: Heater Wiring Harness
- OEM Connector: 2294218-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

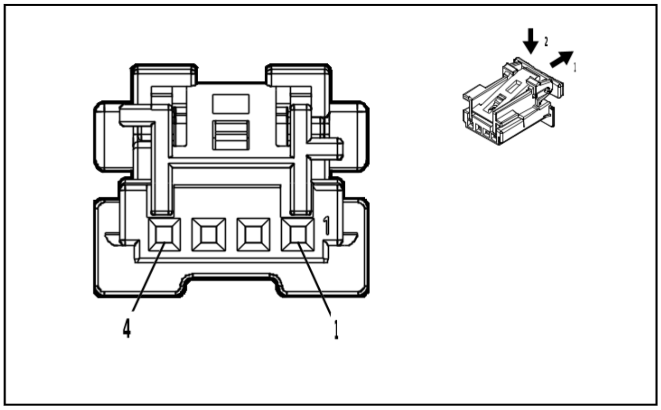
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

M4P Programmable Air Inlet Valve Actuator

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) BU	(2) 2852	(2) Body Control Module LIN Bus 6	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK	(3) 1050	(3) Ground	(3) I	(3) —
(4) 4	(4) 0.35	(4) RD	(4) 4634	(4) HVAC Remote Enable Signal	(4) I	(4) —

M6PL Programmable Temperature Valve Actuator - Left



4997407

Connector Part Information

- Harness Type: Heater Wiring Harness
- OEM Connector: 2294218-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

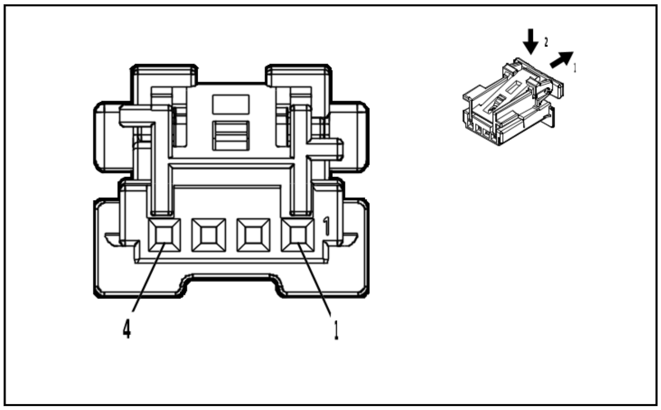
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

M6PL Programmable Temperature Valve Actuator - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) BU	(2) 2852	(2) Body Control Module LIN Bus 6	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK	(3) 1050	(3) Ground	(3) I	(3) —
(4) 4	(4) 0.35	(4) RD	(4) 4634	(4) HVAC Remote Enable Signal	(4) I	(4) —

M6PR Programmable Temperature Valve Actuator - Right



4997407

Connector Part Information
- Harness Type: Heater Wiring Harness
- OEM Connector: 2294218-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

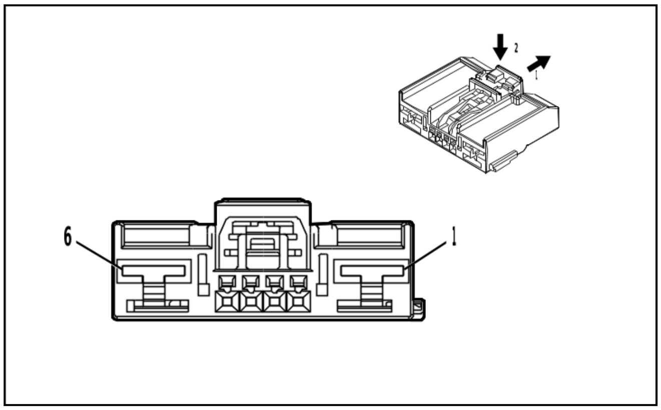
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

M6PR Programmable Temperature Valve Actuator - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) BU	(2) 2852	(2) Body Control Module LIN Bus 6	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.35	(4) RD	(4) 4634	(4) HVAC Remote Enable Signal	(4) I	(4) —

M8 Blower Motor



4650258

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 7289-7139-30
- Service Connector: 19356432
- Description: 6-Way F 0.64, 6.3 Series(BK)

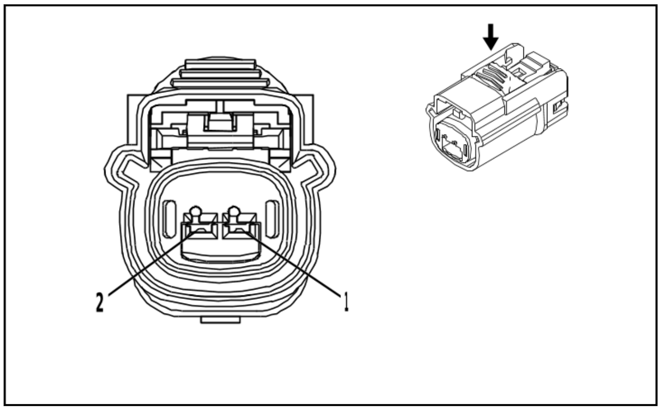
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-64B (L-BU)	No Tool Required

M8 Blower Motor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 4	(1) RD / GY	(1) 1740	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.35	(2) BU / GY	(2) 754	(2) Blower Motor Speed Control	(2) II	(2) —
(3) 3	(3) 0.35	(3) GN / BU	(3) 761	(3) Blower Speed Feedback Signal	(3) II	(3) —
4 - 5	—	—	—	Not Occupied	—	—
(6) 6	(6) 4	(6) BK	(6) 1050	(6) Ground	(6) I	(6) —

M14A Pickup Box Endgate Lock Actuator



4332222

Connector Part Information

- Harness Type: Endgate Wiring Harness
- OEM Connector: 15514573
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 OCS Series, Sealed(BK)

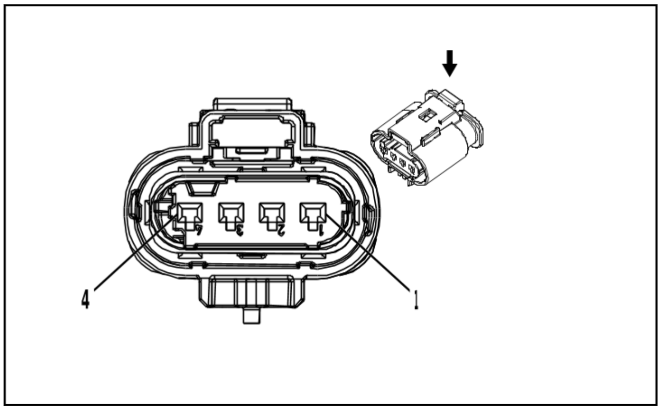
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

M14A Pickup Box Endgate Lock Actuator

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) GN	(1) 1299	(1) Major Endgate Motor Control	(1) I	(1) —
(2) 2	(2) 1	(2) YE / BK	(2) 7730	(2) Major Endgate Motor Low Reference	(2) I	(2) —

M26 Front Drive Axle Actuator



2717079

Connector Part Information

- Harness Type: Transfer Case Selector Shift Control Switch Wiring Harness Extension Harness
- OEM Connector: 10520915
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 1.2 Multilock Series, Sealed(BK)

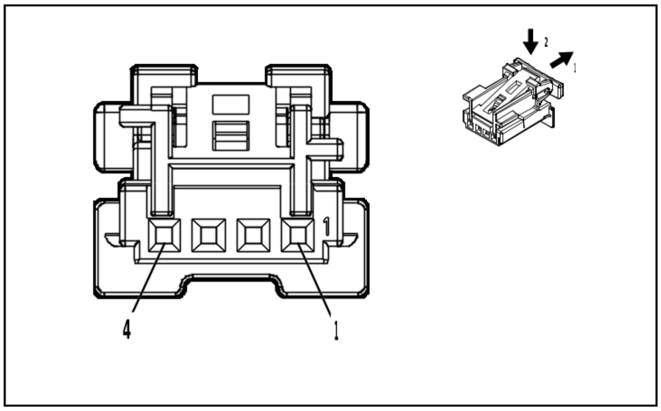
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

M26 Front Drive Axle Actuator

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN	(1) 8016	(1) Secondary Axle Motor Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY / BK	(2) 1570	(2) Front Axle Actuator Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / WH	(3) 1695	(3) 4WD Locked Range Indicator Control	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK	(4) 450	(4) Ground	(4) I	(4) —

M37P Programmable Mode Valve Actuator



4997407

Connector Part Information

- Harness Type: Heater Wiring Harness
- OEM Connector: 2294218-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

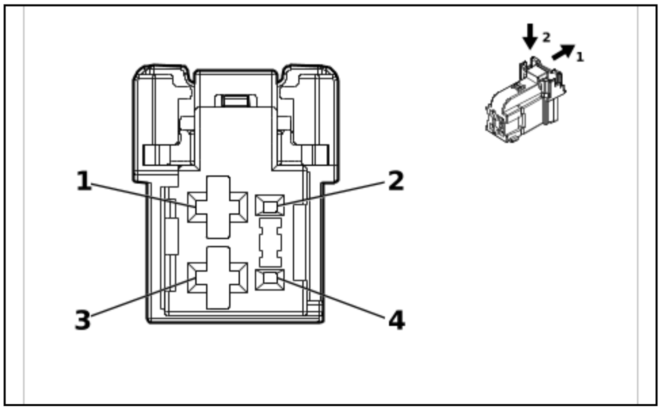
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

M37P Programmable Mode Valve Actuator

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK	(1) 1050	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) BU	(2) 2852	(2) Body Control Module LIN Bus 6	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.35	(4) RD	(4) 4634	(4) HVAC Remote Enable Signal	(4) I	(4) —

M50D Front Seat Tilt Adjuster Actuator - Driver (A2X)



5410027

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 2316171-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64, 2.8 Series(BK)

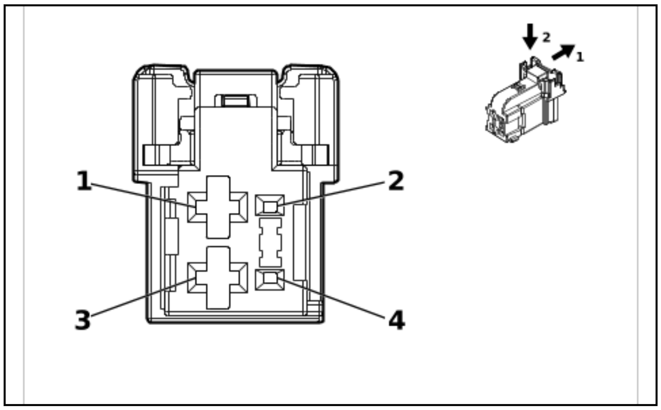
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M50D Front Seat Tilt Adjuster Actuator - Driver (A2X)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) BU / VT	(1) 287	(1) Driver Seat Front Vertical Motor Down Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) GN / BN	(3) 286	(3) Driver Seat Front Vertical Motor Up Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M50P Front Seat Tilt Adjuster Actuator - Passenger (A7K)



5410027

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 2316171-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64, 2.8 Series(BK)

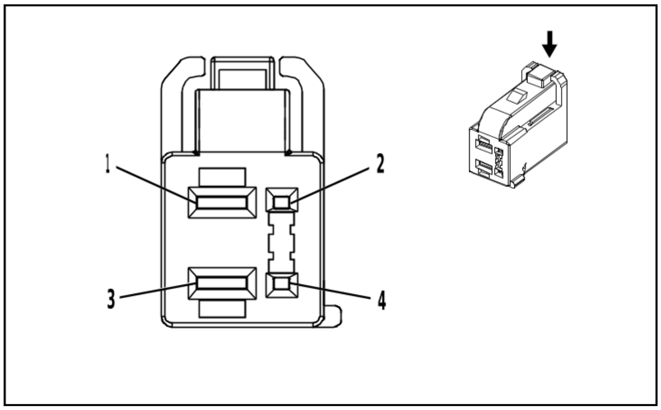
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M50P Front Seat Tilt Adjuster Actuator - Passenger (A7K)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) GN / VT	(1) 297	(1) Passenger Seat Front Vertical Motor Up Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) GN / BU	(3) 298	(3) Passenger Seat Front Vertical Motor Down Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M51D Front Seat Adjuster Actuator - Driver (A2X)



3683652

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 13583828
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64, 2.8 Series(BK)

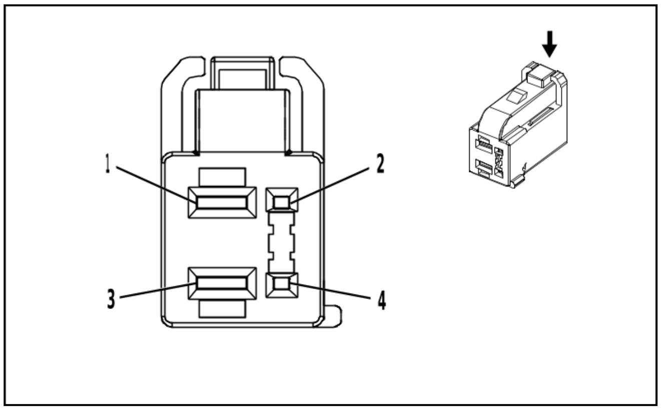
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

M51D Front Seat Adjuster Actuator - Driver (A2X)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) GY / GN	(1) 284	(1) Driver Seat Horizontal Motor Rearward Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) YE / BU	(3) 285	(3) Driver Seat Horizontal Motor Forward Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M51P Front Seat Adjuster Actuator - Passenger (A7K)



3683652

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 13583828
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64, 2.8 Series(BK)

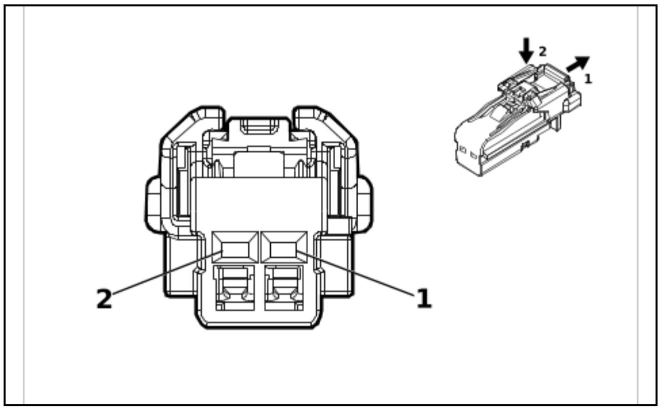
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

M51P Front Seat Adjuster Actuator - Passenger (A7K)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) YE / BU	(1) 290	(1) Passenger Seat Horizontal Motor Rearward Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) YE / WH	(3) 296	(3) Passenger Seat Horizontal Motor Forward Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M53D Front Seat Back Lumbar Motor - Driver (A2X)



4115691

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

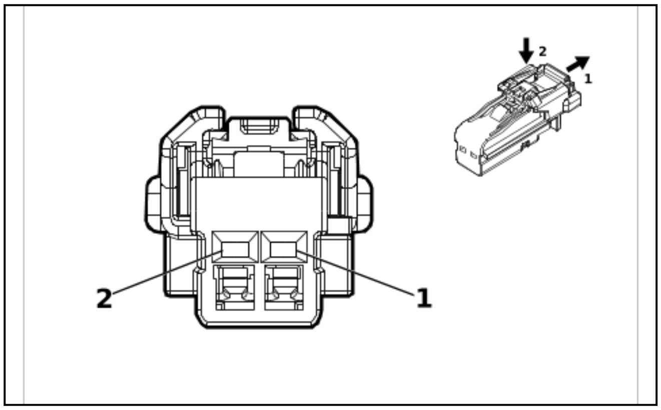
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

M53D Front Seat Back Lumbar Motor - Driver (A2X)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU	(1) 611	(1) Driver Seat Lumbar Support Motor Forward Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) VT	(2) 610	(2) Driver Seat Lumbar Support Motor Backward Control	(2) I	(2) —

M53P Front Seat Back Lumbar Motor - Passenger (A7K)



4115691

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

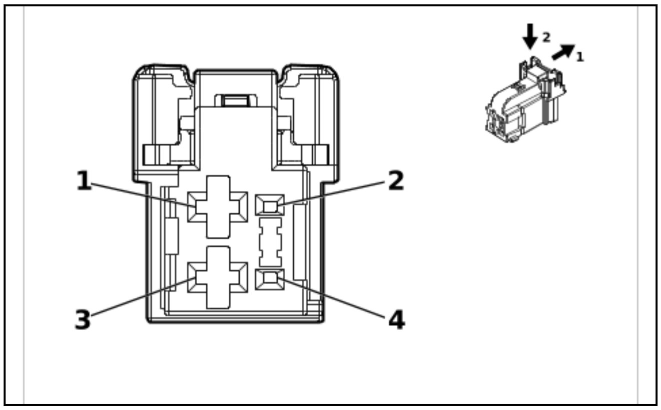
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

M53P Front Seat Back Lumbar Motor - Passenger (A7K)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU	(1) 211	(1) Passenger Seat Lumbar Support Motor Forward Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) VT	(2) 210	(2) Passenger Seat Lumbar Support Motor Backward Control	(2) I	(2) —

M55D Front Seat Vertical Adjuster Actuator - Driver (A2X)



5410027

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 2316171-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64, 2.8 Series(BK)

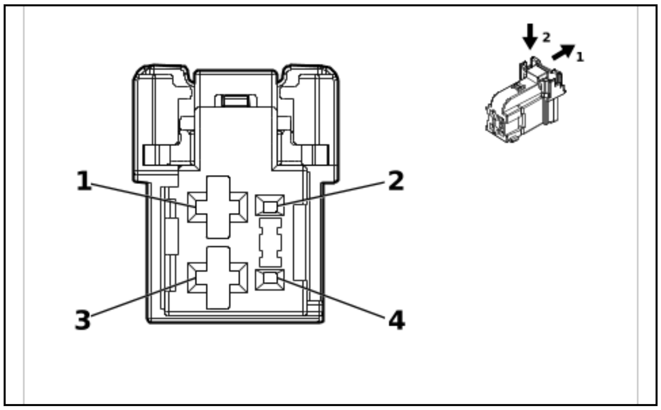
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M55D Front Seat Vertical Adjuster Actuator - Driver (A2X)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) GY / BU	(1) 283	(1) Driver Seat Rear Vertical Motor Down Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) YE	(3) 282	(3) Driver Seat Rear Vertical Motor Up Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M55P Front Seat Vertical Adjuster Actuator - Passenger (A7K)



5410027

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 2316171-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64, 2.8 Series(BK)

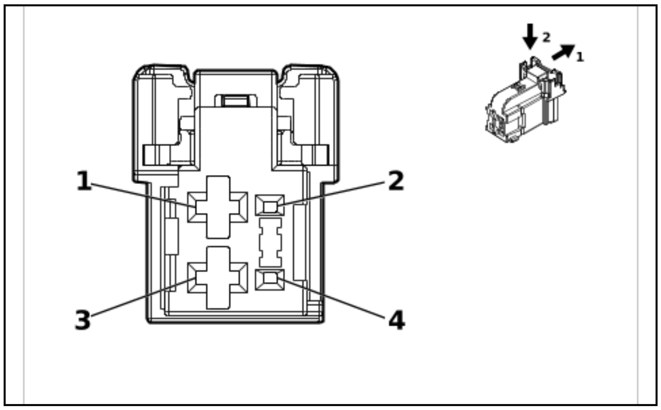
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M55P Front Seat Vertical Adjuster Actuator - Passenger (A7K)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) BU / WH	(1) 289	(1) Passenger Seat Rear Vertical Motor Down Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) GN / WH	(3) 288	(3) Passenger Seat Rear Vertical Motor Up Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M56D Front Seat Recliner Actuator - Driver (A2X)



5410027

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 2316171-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64, 2.8 Series(BK)

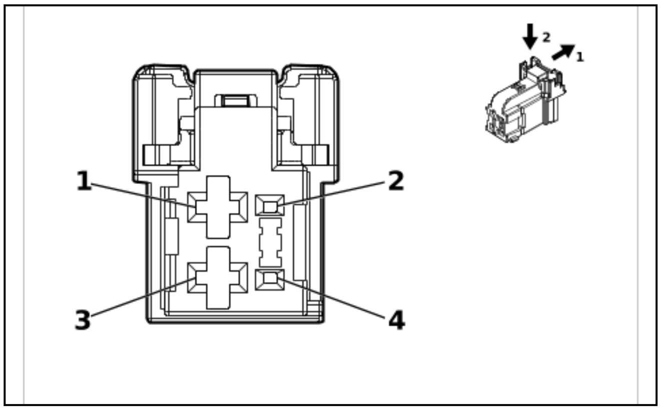
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M56D Front Seat Recliner Actuator - Driver (A2X)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) GN / YE	(1) 276	(1) Driver Seat Recline Motor Forward Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) BU / YE	(3) 277	(3) Driver Seat Recline Motor Rearward Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M56P Front Seat Recliner Actuator - Passenger (A7K)



5410027

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 2316171-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64, 2.8 Series(BK)

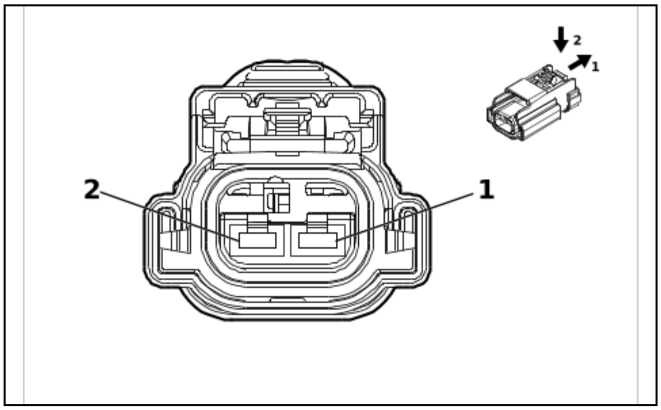
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M56P Front Seat Recliner Actuator - Passenger (A7K)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) GN	(1) 76	(1) Passenger Seat Recline Motor Forward Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 1.5	(3) BU / BN	(3) 77	(3) Passenger Seat Recline Motor Rearward Control	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M63 Rear Sliding Window Motor (A48)



5795169

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35286783
- Service Connector: 19301518
- Description: 2-Way F 2.8 APEX Series, Sealed(BK)

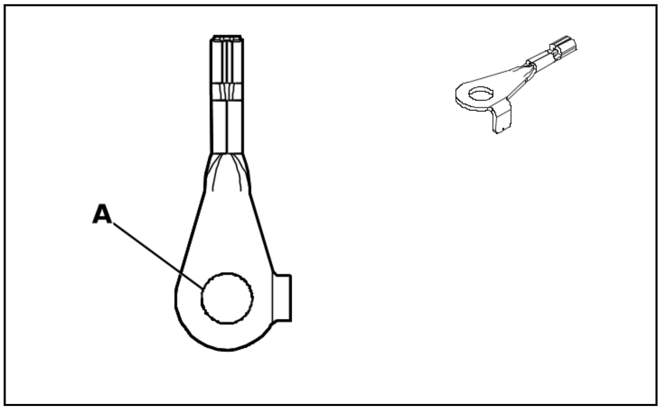
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M63 Rear Sliding Window Motor (A48)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2	(1) YE	(1) 7454	(1) Window Motor Rear Auxiliary Close Control	(1) I	(1) —
(2) 2	(2) 2	(2) VT / YE	(2) 7453	(2) Window Motor Rear Auxiliary Open Control	(2) I	(2) —

M64 Starter X1 (L5P)



5200091

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 35181369
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

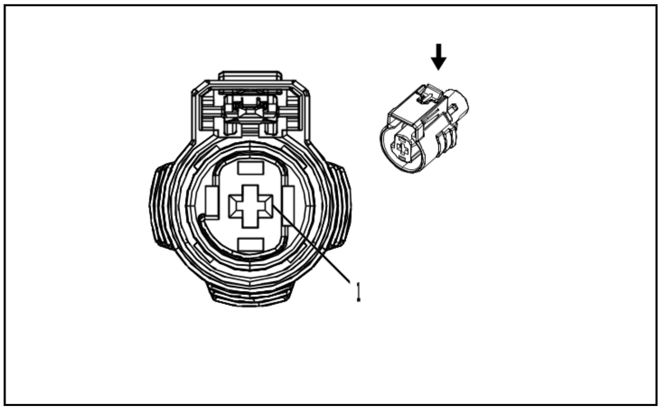
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

M64 Starter X1 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	2.5	YE	6	Starter Solenoid Crank Ignition Voltage	I	—

M64 Starter X1 (L8T)



2717134

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 2098198-5
- Service Connector: 19300471
- Description: 1-Way F 2.8 MCP Series, Sealed(BK)

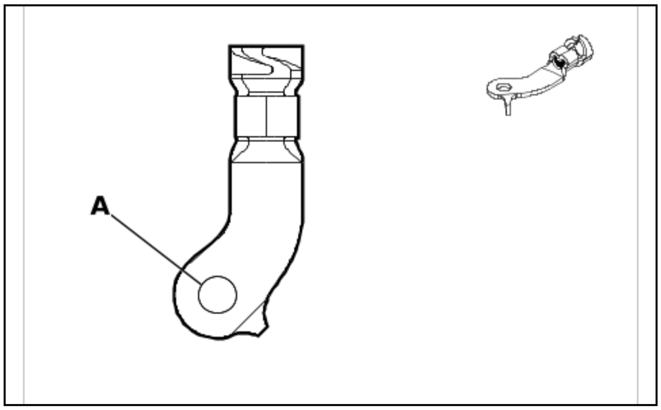
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

M64 Starter X1 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) YE	(1) 6	(1) Starter Solenoid Crank Ignition Voltage	(1) I	(1) —

M64 Starter X2 (L5P)



6444130

Connector Part Information

- Harness Type: Starter Solenoid Cable
- OEM Connector: 84335258
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

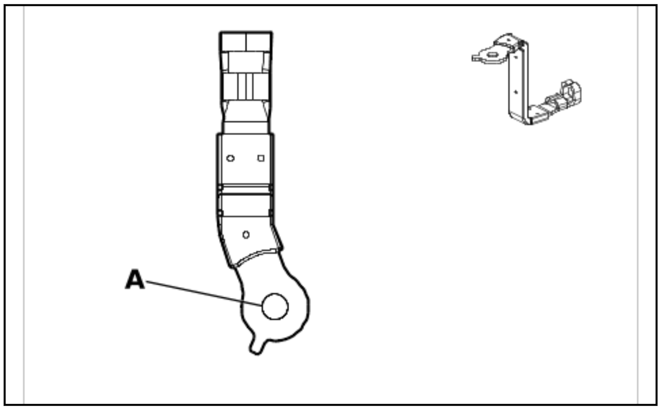
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

M64 Starter X2 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	35	RD / YE	2	Battery Positive Voltage	I	L5P

M64 Starter X2 (L8T)



6056268

Connector Part Information

- Harness Type: Starter Solenoid Cable
- OEM Connector: 85580052
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way Ring Terminal

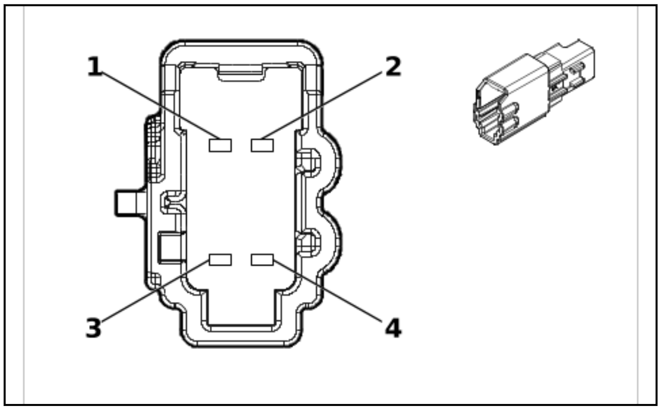
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

M64 Starter X2 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	35	RD / YE	2	Battery Positive Voltage	I	L8T

M73A Front Seat Back Ventilation Blower - Driver (A45 & KQV)



5423974

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 6098-9049
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(GY)

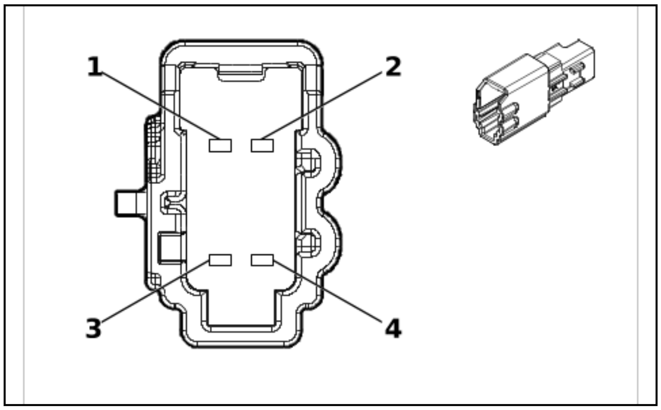
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

M73A Front Seat Back Ventilation Blower - Driver (A45 & KQV)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / WH	(1) 1139	(1) Run/Crank Ignition 1 Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / VT	(2) 5906	(2) Driver Seat Blower Motor Control 1	(2) II	(2) —
(3) 3	(3) 0.75	(3) BK	(3) 1550	(3) Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M73B Front Seat Back Ventilation Blower - Passenger (A7K & KQV)



5423974

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 6098-9049
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(GY)

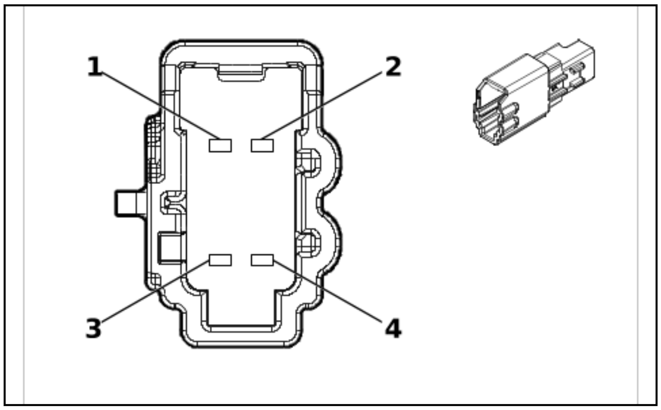
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

M73B Front Seat Back Ventilation Blower - Passenger (A7K & KQV)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / WH	(1) 1139	(1) Run/Crank Ignition 1 Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / WH	(2) 5908	(2) Passenger Seat Blower Motor Control 1	(2) II	(2) —
(3) 3	(3) 0.75	(3) BK	(3) 1350	(3) Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M73D Front Seat Cushion Ventilation Blower - Driver (A45 & KQV)



5423974

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 6098-9049
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(GY)

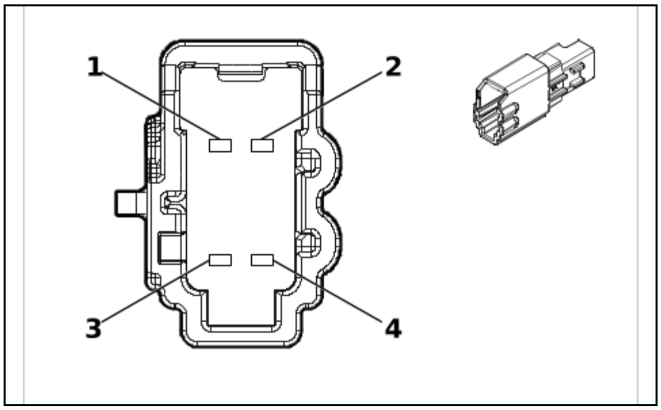
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

M73D Front Seat Cushion Ventilation Blower - Driver (A45 & KQV)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / WH	(1) 1139	(1) Run/Crank Ignition 1 Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / VT	(2) 5906	(2) Driver Seat Blower Motor Control 1	(2) II	(2) —
(3) 3	(3) 0.75	(3) BK	(3) 1550	(3) Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M73P Front Seat Cushion Ventilation Blower - Passenger (A7K & KQV)



5423974

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 6098-9049
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.2 MCON Series(GY)

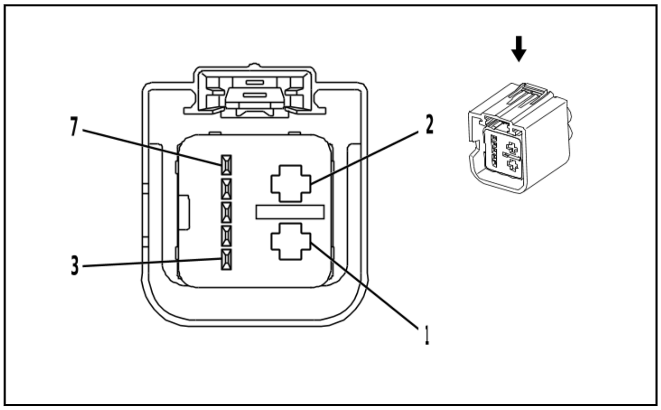
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

M73P Front Seat Cushion Ventilation Blower - Passenger (A7K & KQV)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / WH	(1) 1139	(1) Run/Crank Ignition 1 Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / WH	(2) 5908	(2) Passenger Seat Blower Motor Control 1	(2) II	(2) —
(3) 3	(3) 0.75	(3) BK	(3) 1350	(3) Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

M74D Front Side Door Window Regulator Motor - Driver



2282932

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: 1-1732115-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 7-Way F 0.64, 2.8 Kaizen Timer Series, Sealed(GY)

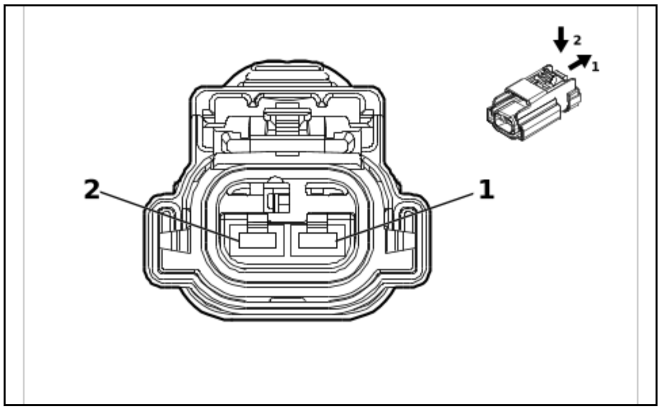
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required
II	Not required	J-35616-64B (L-BU)	No Tool Required

M74D Front Side Door Window Regulator Motor - Driver

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) BK	(1) 1550	(1) Ground	(1) I	(1) —
(2) 2	(2) 2.5	(2) RD / GY	(2) 3540	(2) Battery Positive Voltage	(2) I	(2) —
(3) 3	(3) 0.5	(3) GY / GN	(3) 2763	(3) Window Switch Left Front Up Signal	(3) II	(3) —
(4) 4	(4) 0.5	(4) GN / YE	(4) 6134	(4) Body Control Module LIN Bus 3	(4) II	(4) —
(5) 5	(5) 0.5	(5) GN	(5) 2766	(5) Power Window Switch Left Front Express Signal	(5) II	(5) —
(6) 6	(6) 0.5	(6) GY	(6) 745	(6) Left Front Door Ajar Switch Signal	(6) II	(6) —
(7) 7	(7) 0.5	(7) WH / BN	(7) 2764	(7) Window Switch Left Front Down Signal	(7) II	(7) —

M74LR Rear Side Door Window Regulator Motor - Left



5795169

Connector Part Information

- Harness Type: Rear Side Door Door Wiring Harness - Left
- OEM Connector: 35286783
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 2.8 APEX Series, Sealed(BK)

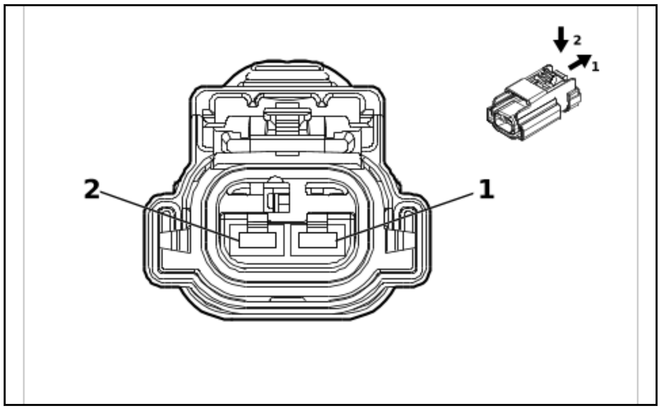
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M74LR Rear Side Door Window Regulator Motor - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2	(1) BU / VT	(1) 668	(1) Left Rear Window Motor Up Control	(1) I	(1) —
(2) 2	(2) 2	(2) YE / BU	(2) 669	(2) Left Rear Window Motor Down Control	(2) I	(2) —

M74P Front Side Door Window Regulator Motor - Passenger (AED)



5795169

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 35286783
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 2.8 APEX Series, Sealed(BK)

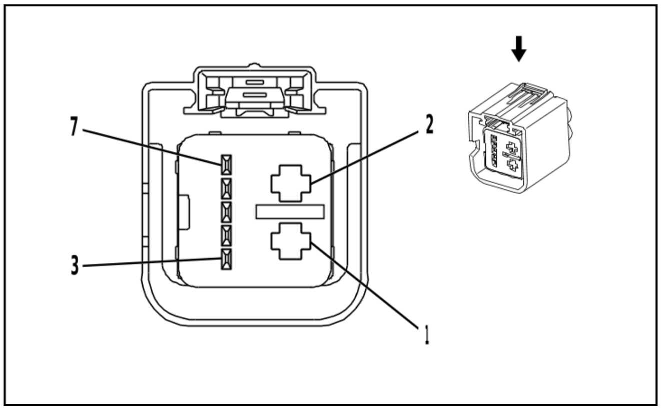
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M74P Front Side Door Window Regulator Motor - Passenger (AED)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2	(1) GN / GY	(1) 666	(1) Right Front Window Motor Up Control	(1) I	(1) —
(2) 2	(2) 2	(2) YE / BU	(2) 667	(2) Right Front Window Motor Down Control	(2) I	(2) —

M74P Front Side Door Window Regulator Motor - Passenger (AEF)



2282932

Connector Part Information
- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 1-1732115-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 7-Way F 0.64, 2.8 Kaizen Timer Series, Sealed(GY)

Terminal Part Information

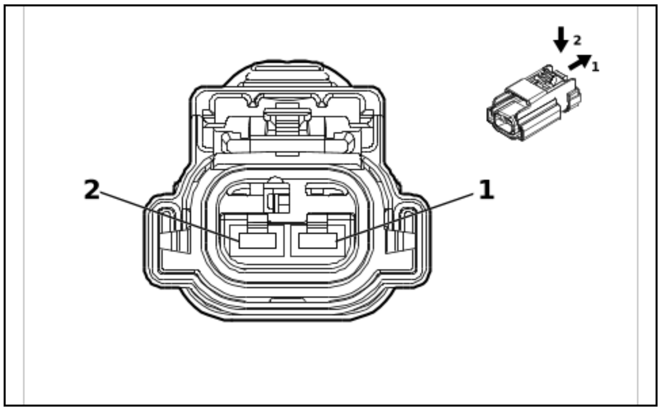
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required
II	Not required	J-35616-64B (L-BU)	No Tool Required

M74P Front Side Door Window Regulator Motor - Passenger (AEF)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) BK	(1) 1350	(1) Ground	(1) I	(1) —
(2) 2	(2) 2.5	(2) RD / BN	(2) 4240	(2) Battery Positive Voltage	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN	(3) 1184	(3) Window Switch Right Front Up Signal	(3) II	(3) —
(4) 4	(4) 0.5	(4) GN / YE	(4) 6134	(4) Body Control Module LIN Bus 3	(4) II	(4) —
(5) 5	(5) 0.5	(5) VT / GY	(5) 2765	(5) Window Switch Right Front Express Signal	(5) II	(5) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(6) 6	(6) 0.5	(6) GY	(6) 746	(6) Right Front Door Ajar Switch Signal	(6) II	(6) —
(7) 7	(7) 0.5	(7) BN	(7) 5295	(7) Window Switch Right Front Down Signal	(7) II	(7) —

M74RR Rear Side Door Window Regulator Motor - Right



5795169

Connector Part Information
- Harness Type: Rear Side Door Door Wiring Harness - Right
- OEM Connector: 35286783
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 2.8 APEX Series, Sealed(BK)

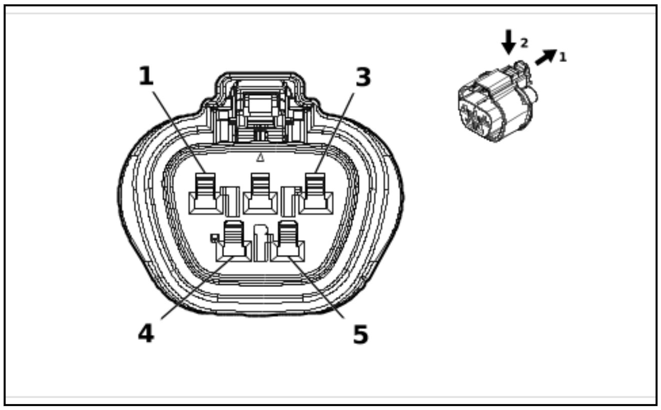
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M74RR Rear Side Door Window Regulator Motor - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2	(1) BU / GY	(1) 670	(1) Right Rear Window Motor Up Control	(1) I	(1) —
(2) 2	(2) 2	(2) GN / BK	(2) 671	(2) Right Rear Window Motor Down Control	(2) I	(2) —

M75 Windshield Wiper Motor



6171401

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 6189-8622
- Service Connector: 85761017
- Description: 5-Way F 2.3 Sumitomo Series, Sealed(BK)

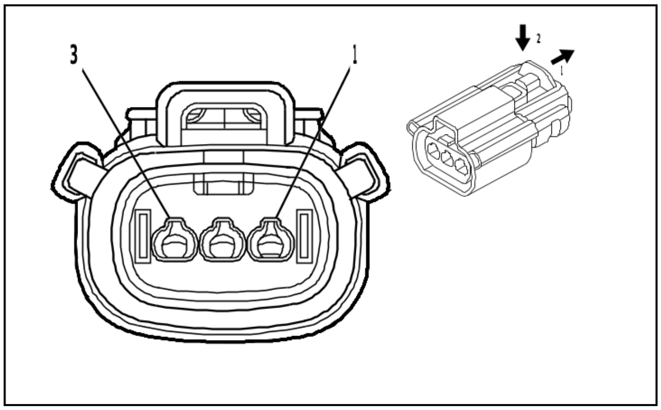
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-18 (BK)	No Tool Required

M75 Windshield Wiper Motor

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2	(1) YE / BN	(1) 95	(1) Windshield Wiper Motor Low Speed Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) BN / GN	(3) 196	(3) Windshield Wiper Motor Park Switch Signal	(3) I	(3) —
(4) 4	(4) 2	(4) WH	(4) 92	(4) Windshield Wiper Motor High Speed Control	(4) I	(4) —
(5) 5	(5) 2	(5) BK	(5) 150	(5) Ground	(5) I	(5) —

M96A Active Grille Air Shutter Actuator 1



5095610

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 33471-3306
- Service Connector: 84719651
- Description: 3-Way F 1.5 Series, Sealed(BK)

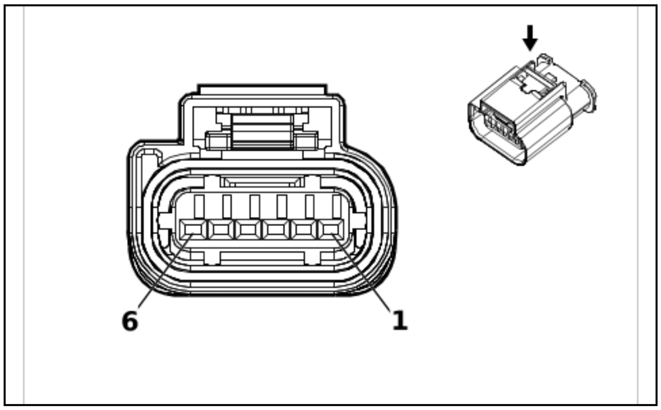
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-2A (GY)	No Tool Required

M96A Active Grille Air Shutter Actuator 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BU	(1) 5705	(1) Powertrain Main Relay Control	(1) II	(1) —
(2) 2	(2) 0.5	(2) GN / VT	(2) 4621	(2) Engine Control Module LIN Bus 1	(2) II	(2) —
(3) 3	(3) 1.5	(3) BK	(3) 450	(3) Ground	(3) I	(3) —

M103 Turbocharger Vane Position Actuator



5483505

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13507084
- Service Connector: 84981395
- Description: 6-Way F 1.2 MCON Series, Sealed(BK)

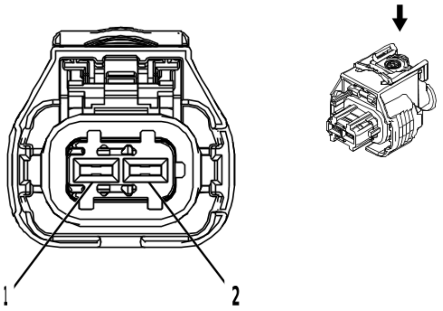
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

M103 Turbocharger Vane Position Actuator

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / GN	(1) 4320	(1) Powertrain Sensor Bus Enable	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / WH	(2) 6151	(2) Engine Control Module Ground	(2) I	(2) —
(3) 3	(3) 0.5	(3) WH	(3) 4055	(3) Private Serial Data Powertrain CAN Bus [+] Serial Data	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH	(4) 4055	(4) Private Serial Data Powertrain CAN Bus [+] Serial Data	(4) I	(4) —
(5) 5	(5) 0.5	(5) BU / GY	(5) 4054	(5) Private Serial Data Powertrain CAN Bus [-] Serial Data	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / GY	(6) 4054	(6) Private Serial Data Powertrain CAN Bus [-] Serial Data	(6) I	(6) —

M104L Parking Brake Actuator - Left



2577394

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: 1 928 405 714
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 2.8 Series, Sealed(BK)

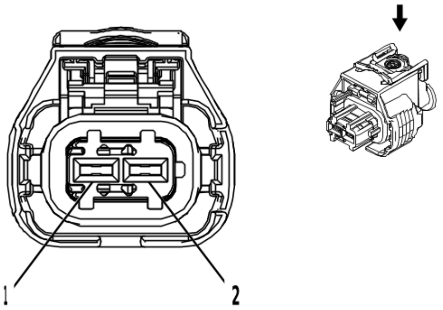
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M104L Parking Brake Actuator - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GN / BK	(1) 4369	(1) Left Park Brake Motor Low Reference	(1) I	(1) —
(2) 2	(2) 2.5	(2) WH	(2) 2001	(2) Left Park Brake Motor Apply Control	(2) I	(2) —

M104R Parking Brake Actuator - Right



2577394

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: 1 928 405 714
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 2.8 Series, Sealed(BK)

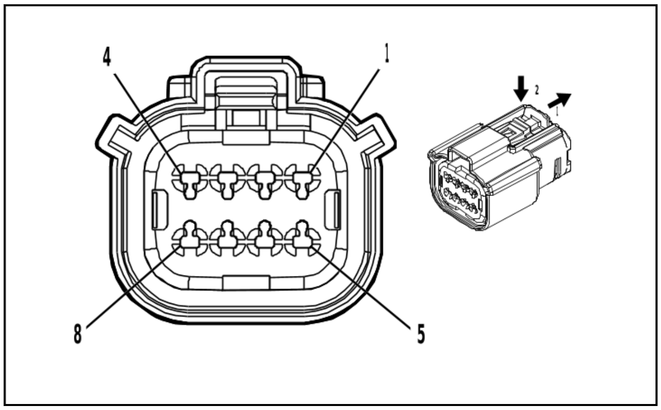
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

M104R Parking Brake Actuator - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY	(1) 4368	(1) Right Park Brake Motor Low Reference	(1) I	(1) —
(2) 2	(2) 2.5	(2) GN / VT	(2) 1988	(2) Right Park Brake Motor Apply Control	(2) I	(2) —

M125 Pickup Box Endgate Power Assist Actuator



4846407

Connector Part Information
- Harness Type: Endgate Wiring Harness
- OEM Connector: 33472-4806
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 1.5 MX Series, Sealed(BK)

Terminal Part Information

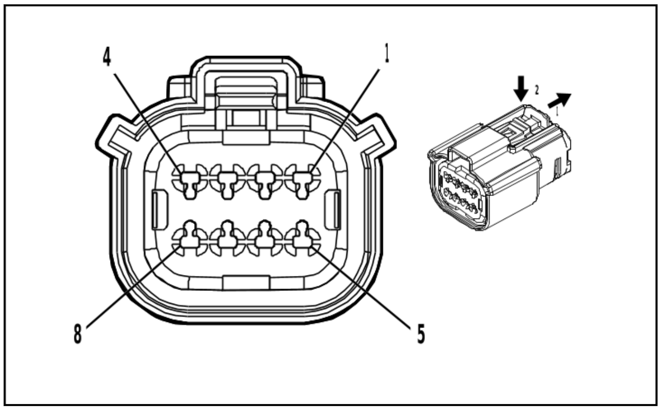
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

M125 Pickup Box Endgate Power Assist Actuator

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) BN / WH	(1) 4690	(1) Rear Closure Open/Close Motor Close Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN	(2) 1577	(2) Rear Closure Clutch Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / BK	(3) 1590	(3) Rear Closure Clutch Low Return	(3) I	(3) —
(4) 4	(4) 0.5	(4) BN / RD	(4) 4683	(4) Rear Closure Position Sensor Voltage Reference	(4) I	(4) —
(5) 5	(5) 1	(5) WH	(5) 4689	(5) Rear Closure Open/Close Motor Open Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) BN / YE	(6) 4686	(6) Rear Closure Position Sensor Signal 2	(6) I	(6) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(7) 7	(7) 0.5	(7) BK / GN	(7) 4687	(7) Rear Closure Position Sensor Low Reference	(7) I	(7) —
(8) 8	(8) 0.5	(8) BU / WH	(8) 4685	(8) Rear Closure Position Sensor Signal 1	(8) I	(8) —

M151L Pickup Box Endgate Cinch Latch Actuator - Left



4846407

Connector Part Information

- Harness Type: Endgate Wiring Harness
- OEM Connector: 33472-4806
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 1.5 MX Series, Sealed(BK)

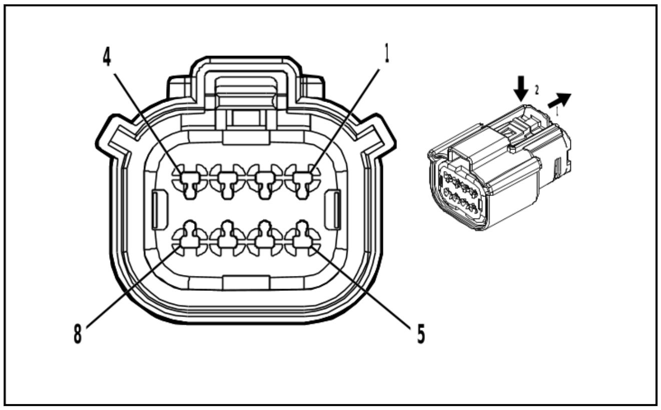
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

M151L Pickup Box Endgate Cinch Latch Actuator - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.5	(2) BN / GY	(2) 10281	(2) Rear Closure Latch Secondary Status Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) GY / VT	(3) 4678	(3) Rear Closure Latch Unlatch Status	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / VT	(4) 4656	(4) Rear Closure Object Sensor Low Reference	(4) I	(4) —
(5) 5	(5) 1	(5) BN	(5) 4681	(5) Rear Closure Cinch Latch Motor Cinch Control	(5) I	(5) —
(6) 6	(6) 1	(6) BU / GY	(6) 4682	(6) Rear Closure Cinch Latch Motor Release Control	(6) I	(6) —
(7) 7	(7) 0.5	(7) WH / GN	(7) 8084	(7) Rear Closure Latch Neutral Status	(7) I	(7) —
(8) 8	(8) 0.5	(8) YE / BK	(8) 8085	(8) Rear Closure Latch Primary Status	(8) I	(8) —

M151R Pickup Box Endgate Cinch Latch Actuator - Right



4846407

Connector Part Information

- Harness Type: Endgate Wiring Harness
- OEM Connector: 33472-4806
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 1.5 MX Series, Sealed(BK)

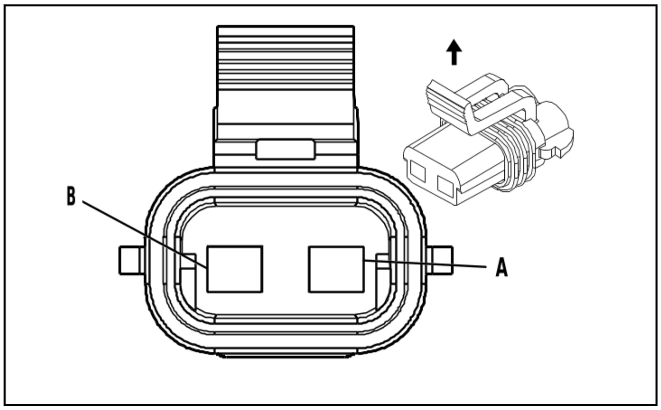
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

M151R Pickup Box Endgate Cinch Latch Actuator - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / BK	(1) 1575	(1) Rear Closure Sensor Low Reference 2	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN	(2) 7736	(2) Rear Closure Latch 2 Unlatch Status Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) VT / WH	(3) 10284	(3) Rear Closure Latch 2 Secondary Status Signal	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.5	(5) GN / BU	(5) 10283	(5) Rear Closure Latch 2 Primary Status Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / BN	(6) 10282	(6) Rear Closure Latch 2 Neutral Status Signal	(6) I	(6) —
(7) 7	(7) 1	(7) GN	(7) 1499	(7) Rear Closure Cinch Latch Motor 2 Cinch Control	(7) I	(7) —
(8) 8	(8) 1	(8) BU	(8) 1509	(8) Rear Closure Cinch Latch Motor 2 Release Control	(8) I	(8) —

P3 Backup Alarm



68721

Connector Part Information
- Harness Type: Backup Alarm Wiring Harness
- OEM Connector: 15300027
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 280 Metri-Pack Series, Sealed(BK)

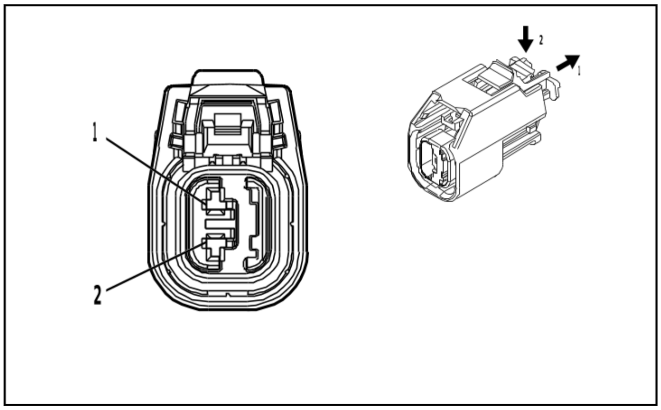
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

P3 Backup Alarm

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	1	GY	1624	Trailer Backup Lamp Control	I	—
B	1	WH	22	Trailer Ground	I	—

P13 Horn



4889830

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 33164011
- Service Connector: 86802964
- Description: 2-Way F 1.5 OCS Series, Sealed(BK)

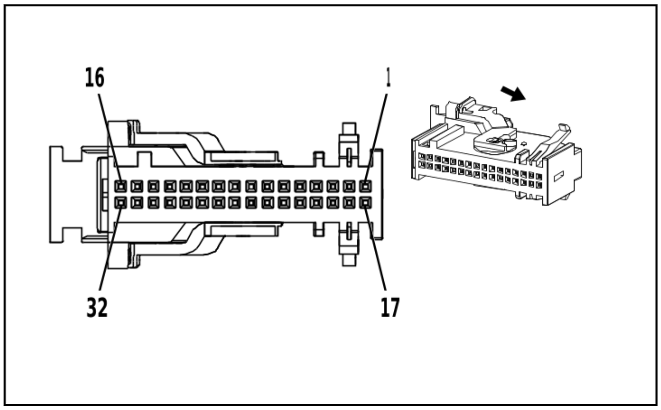
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

P13 Horn

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 650	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.75	(2) BN / GY	(2) 29	(2) Horn Control	(2) I	(2) —

P16 Instrument Panel Cluster Control Module X1



627214

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 13511333
- Service Connector: 13511333
- Description: 32-Way F 0.64 Micro-Quadlock Series(GY)

Terminal Part Information

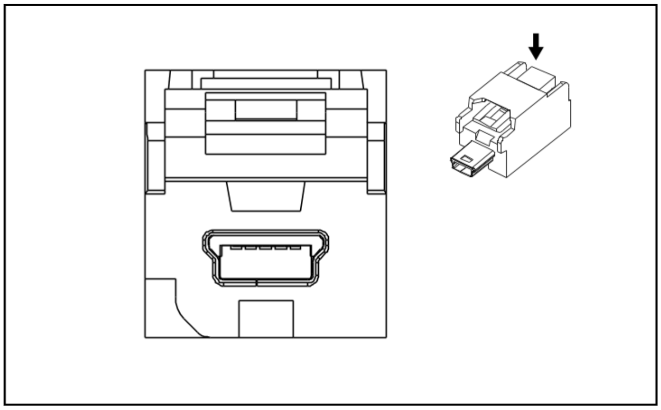
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19300632	J-35616-64B (L-BU)	J-38125-215A
II	Service by Cable	J-35616-64B (L-BU)	EL-38215-215A

P16 Instrument Panel Cluster Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) WH	(1) 7216	(1) Ethernet Bus 7 [-]	(1) II	(1) —
2 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) RD / WH	(7) 1340	(7) Battery Positive Voltage	(7) I	(7) —
(8) 8	(8) 0.35	(8) VT / BK	(8) 339	(8) Run/Crank Ignition 1 Voltage	(8) I	(8) —
9 - 10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) GY / BK	(11) 4787	(11) Day Night LED Control	(11) I	(11) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(12) 12	(12) 0.35	(12) GY / YE	(12) 3885	(12) Forward Collision Alert LED Control	(12) I	(12) —
(13) 13	(13) 0.35	(13) BU / WH	(13) 4985	(13) AUTOSAR CAN Bus [+] 5 Serial Data	(13) I	(13) —
(14) 14	(14) 0.35	(14) BU / YE	(14) 4984	(14) AUTOSAR CAN Bus [-] 5 Serial Data	(14) I	(14) —
15 - 16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.35	(17) GN	(17) 7217	(17) Ethernet Bus 7 [+]	(17) II	(17) —
18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.5	(19) BK / WH	(19) 851	(19) Signal Ground	(19) I	(19) —
(20) 20	(20) 0.5	(20) GN / BK	(20) 3894	(20) Instrument Panel Cluster Control Module LIN Bus 1	(20) I	(20) —
21 - 28	—	—	—	Not Occupied	—	—
(29) 29	(29) 0.35	(29) BU / WH	(29) 4985	(29) AUTOSAR CAN Bus [+] 5 Serial Data	(29) I	(29) —
(30) 30	(30) 0.35	(30) BU / YE	(30) 4984	(30) AUTOSAR CAN Bus [-] 5 Serial Data	(30) I	(30) —
31	—	—	—	Not Occupied	—	—
(32) 32	(32) 0.35	(32) GN / BN	(32) 507	(32) Wait To Start Indicator Control	(32) I	(32) —

P16 Instrument Panel Cluster Control Module X2



3214018

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness LVDS
- OEM Connector: 13893437
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 5-Way M 2.0 Mini-B USB Type(GY)

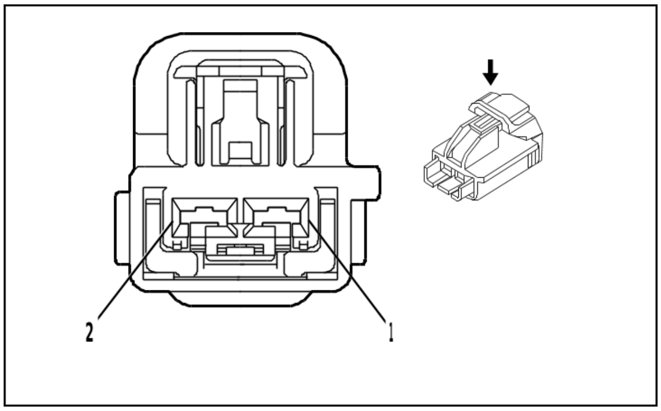
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

P16 Instrument Panel Cluster Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	LVDS	—	(Head Up Display) Head Up Display Signal	I	—

P19AFC Front Floor Speaker - Console (UQA)



1803142

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 7283-6445-40
- Service Connector: 19367562
- Description: 2-Way F Kaizen Series(L-GY)

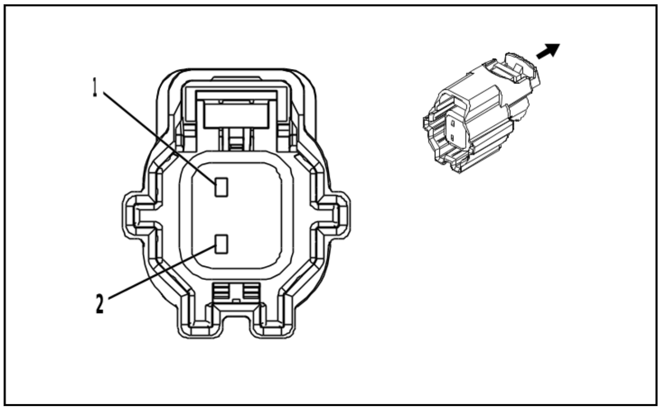
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

P19AFC Front Floor Speaker - Console (UQA)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GN / BK	(1) 1794	(1) Left/Rear Subwoofer [-] Control	(1) I	(1) —
(2) 2	(2) 2.5	(2) BU / GY	(2) 346	(2) Left/Rear Subwoofer [+] Control	(2) I	(2) —

P19AG Radio Front Side Door Speaker - Left



4223204

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: 34062-0044
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 MX Series, Sealed(BK)

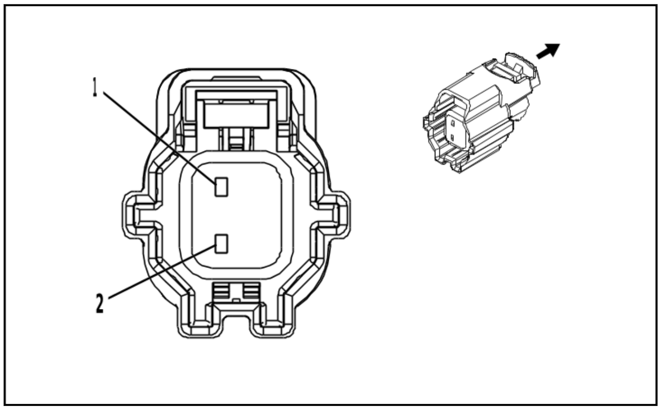
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

P19AG Radio Front Side Door Speaker - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / BU	(1) 118	(1) Left Front Speaker [-] Control 1	(1) I	(1) —
(2) 2	(2) 0.75	(2) BU	(2) 201	(2) Left Front Speaker 1 [+] Control	(2) I	(2) —

P19AH Radio Front Side Door Speaker - Right



4223204

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 34062-0044
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 MX Series, Sealed(BK)

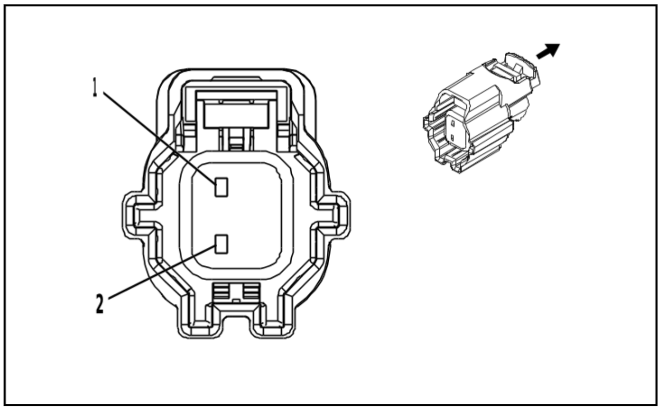
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

P19AH Radio Front Side Door Speaker - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) YE / BK	(1) 117	(1) Right Front Speaker [-] Control 1	(1) I	(1) —
(2) 2	(2) 0.75	(2) YE	(2) 200	(2) Right Front Speaker 1 [+] Control	(2) I	(2) —

P19AL Radio Rear Side Door Speaker - Left



4223204

Connector Part Information
- Harness Type: Rear Side Door Door Wiring Harness - Left
- OEM Connector: 34062-0044
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 MX Series, Sealed(BK)

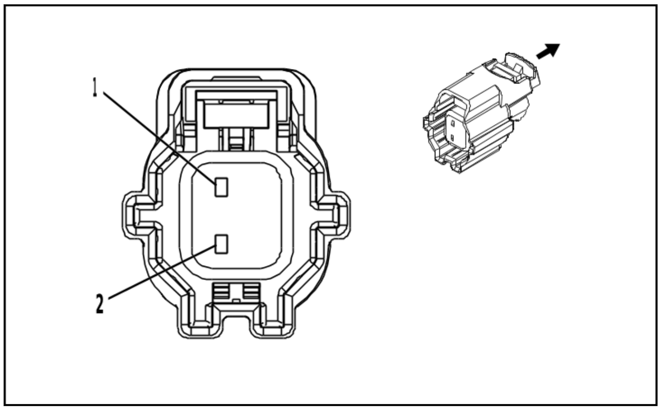
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

P19AL Radio Rear Side Door Speaker - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN / BK	(1) 116	(1) Left Rear Speaker [-] Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) GN	(2) 199	(2) Left Rear Speaker [+] Control	(2) I	(2) —

P19AM Radio Rear Side Door Speaker - Right



4223204

Connector Part Information

- Harness Type: Rear Side Door Door Wiring Harness - Right
- OEM Connector: 34062-0044
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 MX Series, Sealed(BK)

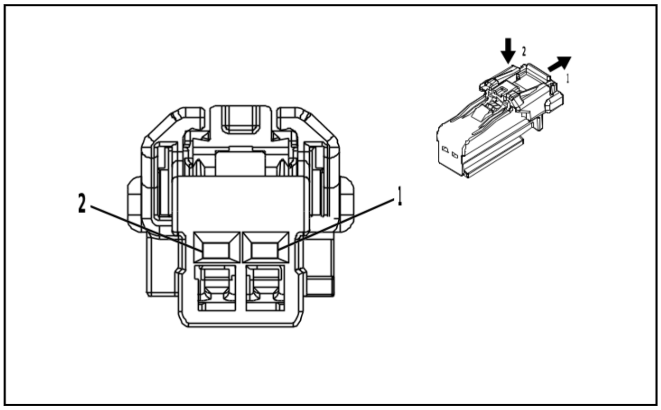
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

P19AM Radio Rear Side Door Speaker - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / BK	(1) 115	(1) Right Rear Speaker [-] Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) WH	(2) 46	(2) Right Rear Speaker [+] Control	(2) I	(2) —

P19J Radio Front Speaker - Instrument Panel Left (UQA)



4373379

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8989
- Service Connector: 19369632
- Description: 2-Way F 1.2 MCON Series(GY)

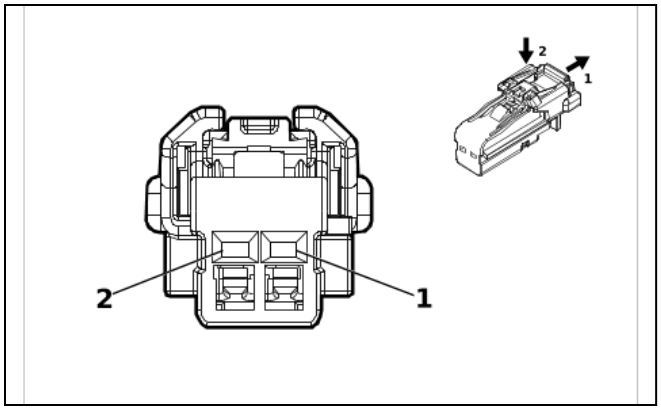
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

P19J Radio Front Speaker - Instrument Panel Left (UQA)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / BN	(1) 1957	(1) Left Front Midrange Speaker [-] Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) BU / VT	(2) 1857	(2) Left Front Midrange Speaker [+] Control	(2) I	(2) —

P19J Radio Front Speaker - Instrument Panel Left (UQF)



4115691

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: 87816612
- Description: 2-Way F 1.2 MCON Series(BK)

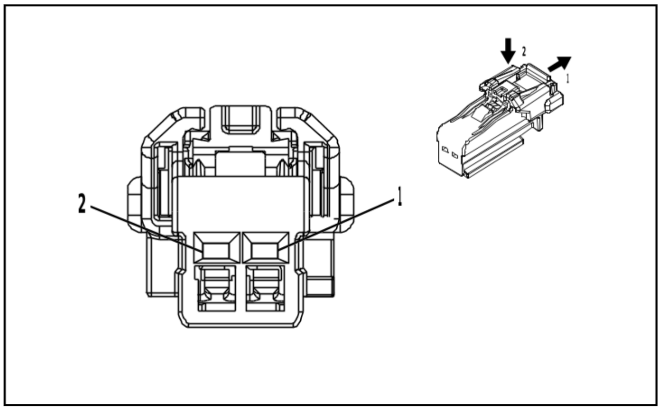
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

P19J Radio Front Speaker - Instrument Panel Left (UQF)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / BU	(1) 118	(1) Left Front Speaker [-] Control 1	(1) I	(1) —
(2) 2	(2) 0.75	(2) BU	(2) 201	(2) Left Front Speaker 1 [+] Control	(2) I	(2) —

P19W Radio Front Speaker - Instrument Panel Right (UQA)



4373379

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8989
- Service Connector: 19369632
- Description: 2-Way F 1.2 MCON Series(GY)

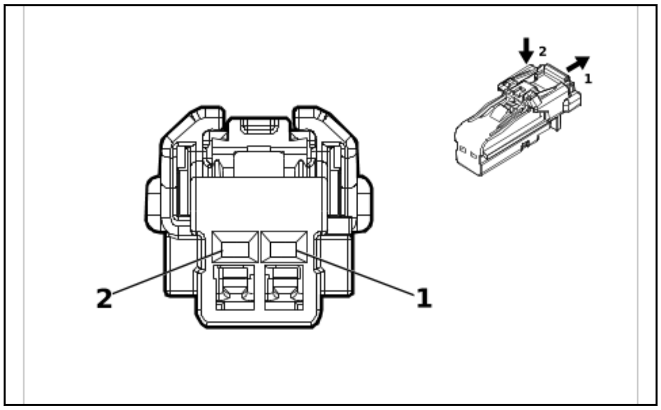
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

P19W Radio Front Speaker - Instrument Panel Right (UQA)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / BK	(1) 1953	(1) Right Front Midrange Speaker [-] Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) WH / YE	(2) 1853	(2) Right Front Midrange Speaker [+] Control	(2) I	(2) —

P19W Radio Front Speaker - Instrument Panel Right (UQF)



4115691

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: 87816612
- Description: 2-Way F 1.2 MCON Series(BK)

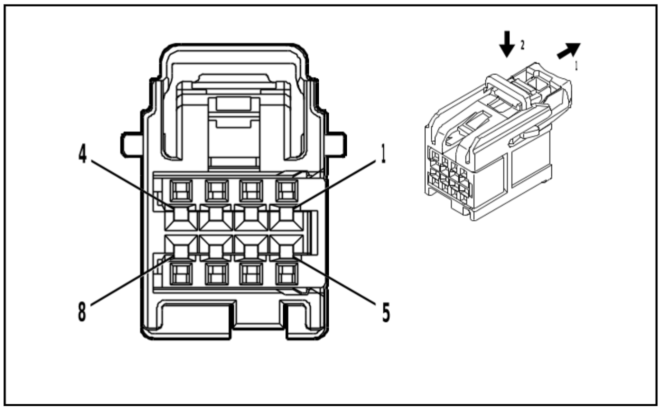
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

P19W Radio Front Speaker - Instrument Panel Right (UQF)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) YE / BK	(1) 117	(1) Right Front Speaker [-] Control 1	(1) I	(1) —
(2) 2	(2) 0.75	(2) YE	(2) 200	(2) Right Front Speaker 1 [+] Control	(2) I	(2) —

P29 Head-Up Display X1



4935776

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 15526972
- Service Connector: 19370429
- Description: 8-Way F 0.64 OCS Series(BK)

Terminal Part Information

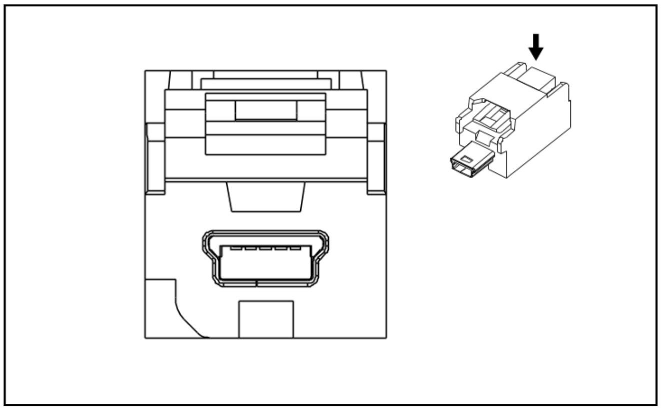
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

P29 Head-Up Display X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN / BK	(1) 3894	(1) Instrument Panel Cluster Control Module LIN Bus 1	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) YE / WH	(3) 622	(3) Head-Up Display Switch Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / WH	(4) 851	(4) Signal Ground	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.5	(6) RD / WH	(6) 1340	(6) Battery Positive Voltage	(6) I	(6) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.35	(8) BK / GN	(8) 5699	(8) Head-Up Display Switch Low Reference	(8) I	(8) —

P29 Head-Up Display X2



3214018

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness LVDS
- OEM Connector: 13871470
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 5-Way M 2.0 Mini-B USB Type(GY)

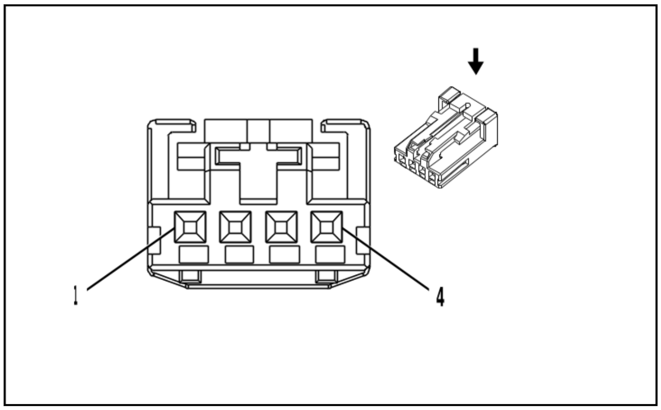
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

P29 Head-Up Display X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	LVDS	—	(Head Up Display) Head Up Display Signal	I	—

P43 Forward Collision Alert Display



2717162

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 1-936119-1
- Service Connector: 19332889
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

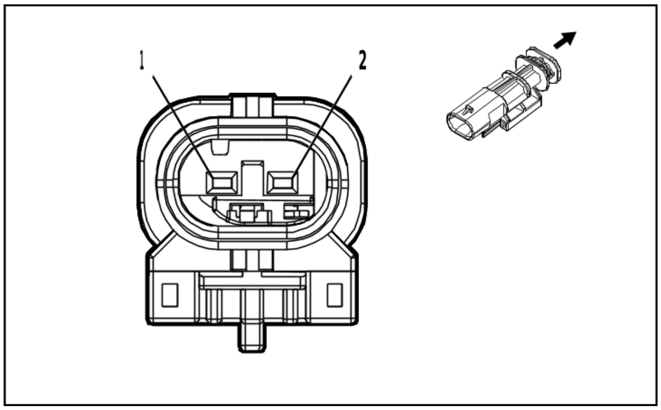
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

P43 Forward Collision Alert Display

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) VT / BK	(1) 339	(1) Run/Crank Ignition 1 Voltage	(1) I	(1) —
(2) 2	(2) 0.35	(2) GY / YE	(2) 3885	(2) Forward Collision Alert LED Control	(2) I	(2) —
(3) 3	(3) 0.35	(3) GY / BK	(3) 4787	(3) Day Night LED Control	(3) I	(3) —
(4) 4	(4) 0.35	(4) BK / WH	(4) 851	(4) Signal Ground	(4) I	(4) —

P45L Front Seat Lane Departure Warning Actuator - Left (HS1)



4569729

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 34899-2080
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 MCON Series, Sealed(BK)

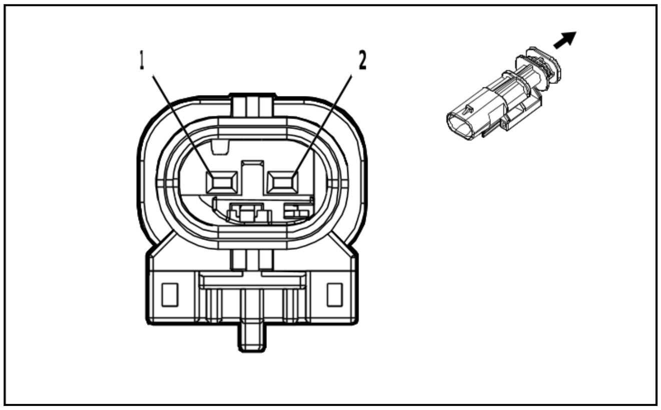
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

P45L Front Seat Lane Departure Warning Actuator - Left (HS1)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1550	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) YE / BN	(2) 3037	(2) Driver Seat Left Rear Haptic Movement Motor Control	(2) I	(2) —

P45R Front Seat Lane Departure Warning Actuator - Right (HS1)



4569729

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 34899-2080
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 MCON Series, Sealed(BK)

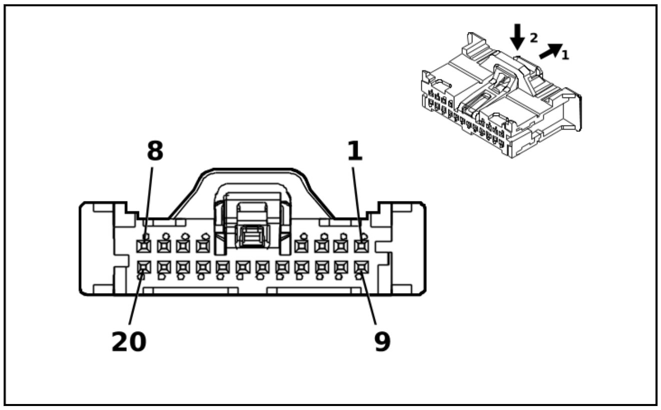
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-13 (BU)	No Tool Required

P45R Front Seat Lane Departure Warning Actuator - Right (HS1)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1550	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) BN	(2) 3038	(2) Driver Seat Right Rear Haptic Movement Motor Control	(2) I	(2) —

P53 Driver Information Display X1



5200955

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35068196
- Service Connector: 84769280
- Description: 20-Way F Mini 50 Series(BK)

Terminal Part Information

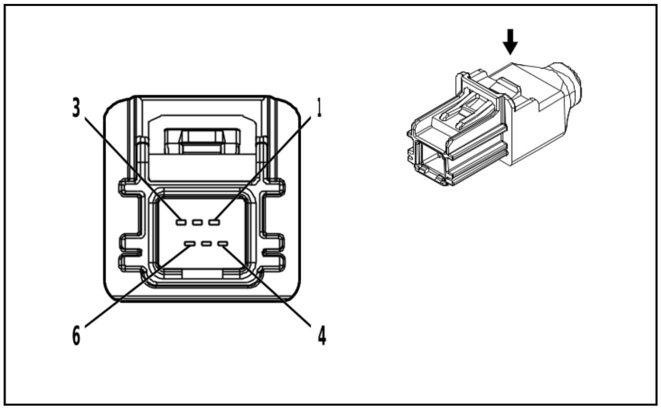
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84944580	EL-35616-58 (BK)	EL-38125-58

P53 Driver Information Display X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BU / RD	(1) 11246	(1) Infotainment Display 5 Volt Reference	(1) I	(1) —
(2) 2	(2) 0.35	(2) GY / BU	(2) 11247	(2) Infotainment Display LCD Enable Signal	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.35	(4) BU	(4) 11235	(4) Radio Switch Volume Up Signal	(4) I	(4) —
(5) 5	(5) 0.35	(5) GY / BN	(5) 11234	(5) Radio Switch Volume Down Signal	(5) I	(5) —
(6) 6	(6) 0.35	(6) BN / WH	(6) 11233	(6) Radio Switch Power ON/OFF Switch Signal	(6) I	(6) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(7) 7	(7) 0.35	(7) VT / WH	(7) 11245	(7) Radio Switch Buttons Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) BU / GY	(8) 11244	(8) Radio Switch Dimming Control	(8) I	(8) —
(9) 9	(9) 0.35	(9) BU / GN	(9) 11248	(9) Infotainment Display Backlight Dimming Control	(9) I	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) BK / WH	(11) 11252	(11) Infotainment Display Low Reference	(11) I	(11) —
(12) 12	(12) 0.35	(12) YE / RD	(12) 11236	(12) Radio Switch 5 Volt Reference	(12) I	(12) —
(13) 13	(13) 0.35	(13) BK / BU	(13) 11237	(13) Radio Switch Low Reference 1	(13) I	(13) —
(14) 14	(14) 0.35	(14) BU	(14) 11235	(14) Radio Switch Volume Up Signal	(14) I	(14) —
(15) 15	(15) 0.35	(15) GY / BN	(15) 11234	(15) Radio Switch Volume Down Signal	(15) I	(15) —
(16) 16	(16) 0.35	(16) BN / WH	(16) 11233	(16) Radio Switch Power ON/OFF Switch Signal	(16) I	(16) —
(17) 17	(17) 0.35	(17) VT / WH	(17) 11245	(17) Radio Switch Buttons Signal	(17) I	(17) —
(18) 18	(18) 0.35	(18) BU / GY	(18) 11244	(18) Radio Switch Dimming Control	(18) I	(18) —
(19) 19	(19) 0.35	(19) GY / VT	(19) 11249	(19) Infotainment Display Backlight Enable Control	(19) I	(19) —
(20) 20	(20) 0.35	(20) BK / GN	(20) 11238	(20) Radio Switch Low Reference 2	(20) I	(20) —

P53 Driver Information Display X2



4806625

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 100337-1020
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 6-Way M HSAL-2 Series(BK)

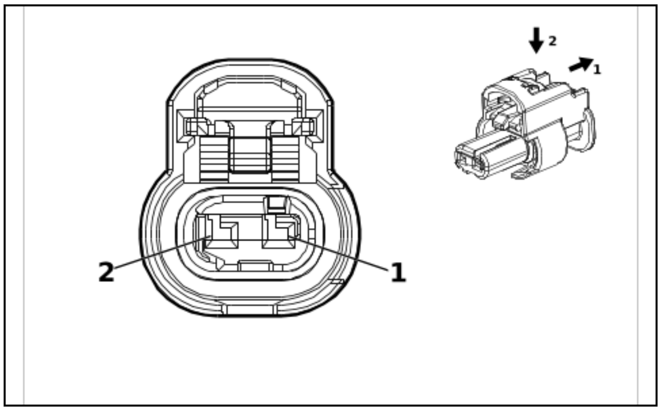
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

P53 Driver Information Display X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
BK	—	<p01>	LVDS	Low Voltage Differential Signaling	I	—

Q2 Air Conditioning Clutch



4649903

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 1-2296694-1
- Service Connector: 85761014
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

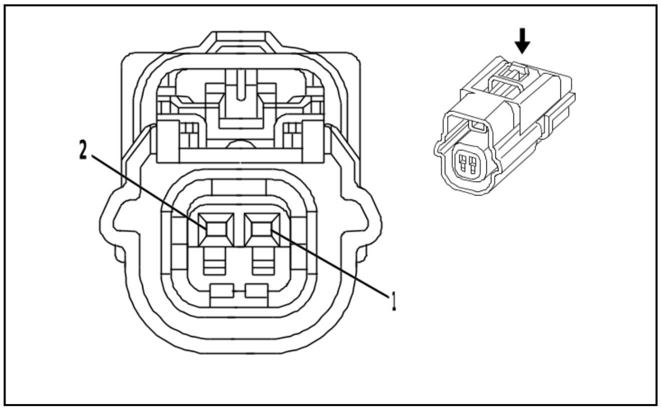
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

Q2 Air Conditioning Clutch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) BK	(1) 450	(1) Ground	(1) I	(1) —
(2) 2	(2) 0.75	(2) BN / GN	(2) 59	(2) Air Conditioning Compressor Clutch Control	(2) I	(2) —

Q6 Camshaft Position Actuator Solenoid Valve



1664592

Connector Part Information

- Harness Type: Camshaft Position Sensor Wire
- OEM Connector: 89047381
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 0.64 Kaizen Series, Sealed(BK)

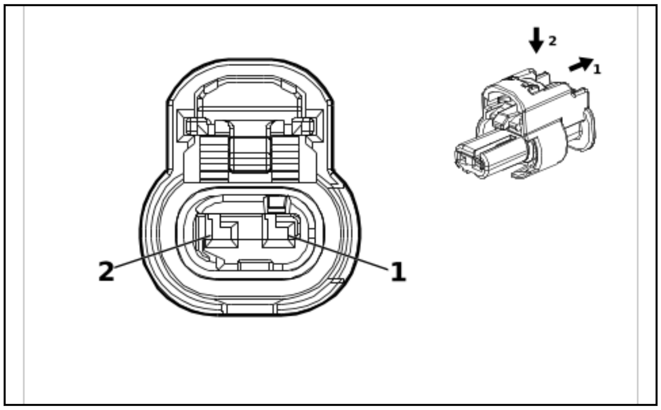
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

Q6 Camshaft Position Actuator Solenoid Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / BN	(1) 6753	(1) Camshaft Position Actuator Solenoid Valve 1 Low Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT / BN	(2) 5284	(2) Intake Camshaft Position Actuator Solenoid Valve 1	(2) I	(2) —

Q9R Differential Locking Actuator - Rear



4649903

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

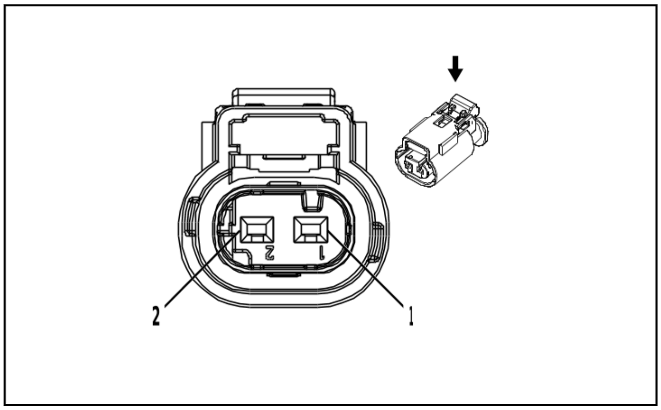
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

Q9R Differential Locking Actuator - Rear

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / BN	(1) 7258	(1) Rear Differential Lock Actuator Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) GY / BK	(2) 7253	(2) Rear Differential Lock Actuator Low Control	(2) I	(2) —

Q12 Evaporative Emission Canister Purge Solenoid Valve



2717066

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 10010337
- Service Connector: 13587326
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

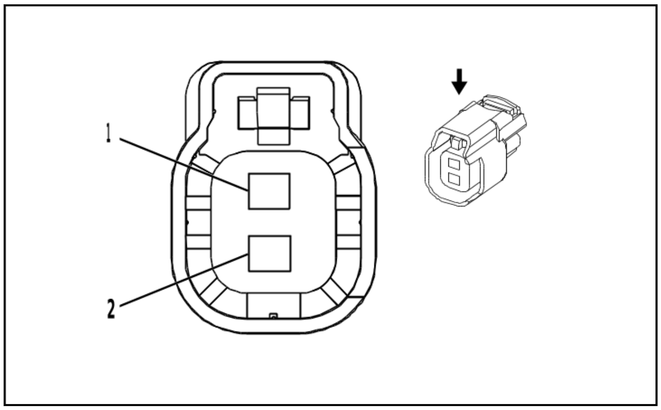
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

Q12 Evaporative Emission Canister Purge Solenoid Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BU	(1) 5293	(1) Powertrain Main Relay Fused Supply Voltage 4	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / BU	(2) 428	(2) EVAP Canister Purge Solenoid Control	(2) I	(2) —

Q13 Evaporative Emission Canister Vent Solenoid Valve



2422378

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 34062-0028
- Service Connector: 13579002
- Description: 2-Way F 1.5 Series, Sealed(BK)

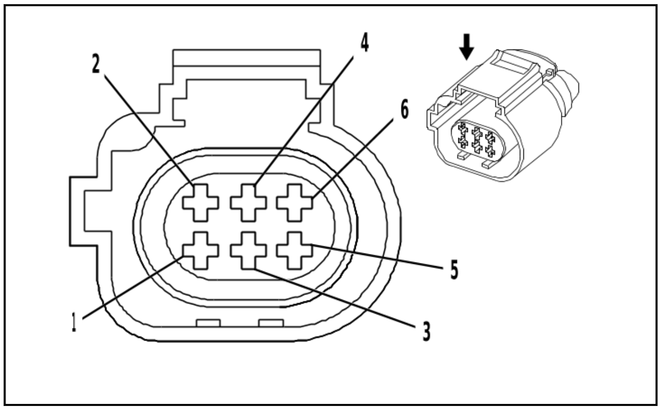
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

Q13 Evaporative Emission Canister Vent Solenoid Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 1310	(1) EVAP Vent Solenoid Valve Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) RD / WH	(2) 3440	(2) Battery Positive Voltage	(2) I	(2) —

Q14 Exhaust Gas Recirculation Valve



2216905

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 55571435
- Service Connector: 19354082
- Description: 6-Way F 1.6 Micro-Timer Series, Sealed(GY)

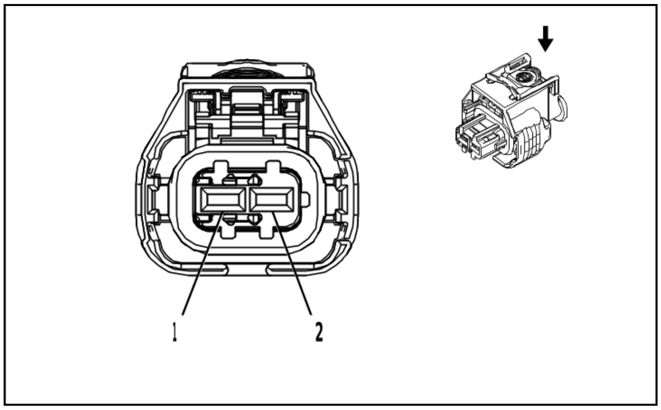
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

Q14 Exhaust Gas Recirculation Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / VT	(1) 5764	(1) Exhaust Gas Recirculation Valve High Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / WH	(2) 5763	(2) Exhaust Gas Recirculation Position Signal	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.5	(4) BK / YE	(4) 548	(4) Engine Control Sensors Low Reference 1	(4) I	(4) —
(5) 5	(5) 0.5	(5) VT / BK	(5) 5746	(5) Exhaust Gas Recirculation Valve Low Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / RD	(6) 460	(6) Engine Control Sensors 5 Volt Reference 1	(6) I	(6) —

Q17A Fuel Injector 1 (L5P)



2845578

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13343445
- Service Connector: 19368140
- Description: 2-Way F 2.8 Series, Sealed(BK)

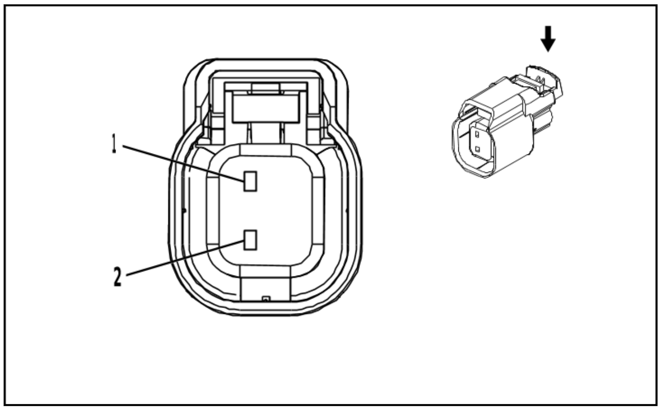
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q17A Fuel Injector 1 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / WH	(1) 4901	(1) Direct Fuel Injector High Voltage Supply Cylinder 1	(1) I	(1) —
(2) 2	(2) 0.75	(2) BN	(2) 4801	(2) Direct Fuel Injector High Voltage Control Cylinder 1	(2) I	(2) —

Q17A Fuel Injector 1 (L8T)



2792100

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Left
- OEM Connector: 340624008
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

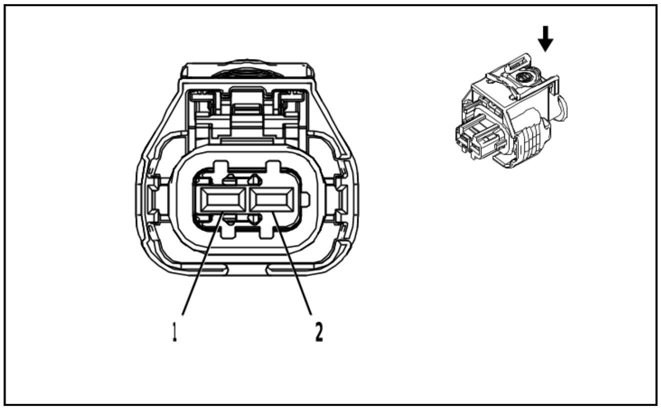
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q17A Fuel Injector 1 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / WH	(1) 4901	(1) Direct Fuel Injector High Voltage Supply Cylinder 1	(1) I	(1) —
(2) 2	(2) 0.75	(2) BN	(2) 4801	(2) Direct Fuel Injector High Voltage Control Cylinder 1	(2) I	(2) —

Q17B Fuel Injector 2 (L5P)



2845578

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13343445
- Service Connector: 19368140
- Description: 2-Way F 2.8 Series, Sealed(BK)

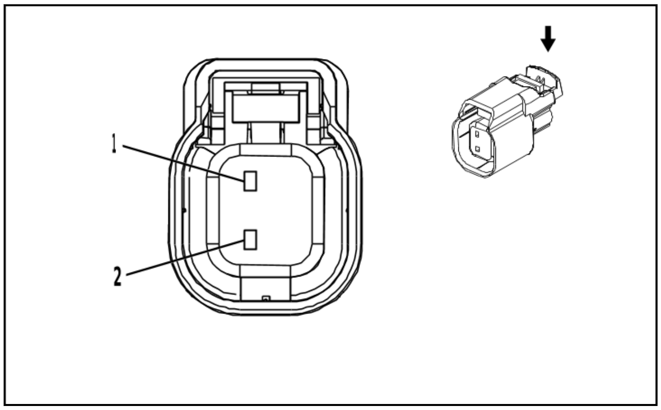
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q17B Fuel Injector 2 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / GY	(1) 4902	(1) Direct Fuel Injector High Voltage Supply Cylinder 2	(1) I	(1) —
(2) 2	(2) 0.75	(2) BU	(2) 4802	(2) Direct Fuel Injector High Voltage Control Cylinder 2	(2) I	(2) —

Q17B Fuel Injector 2 (L8T)



2792100

Connector Part Information

- Harness Type: Fuel Injector Wiring Harness - Right
- OEM Connector: 340624008
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

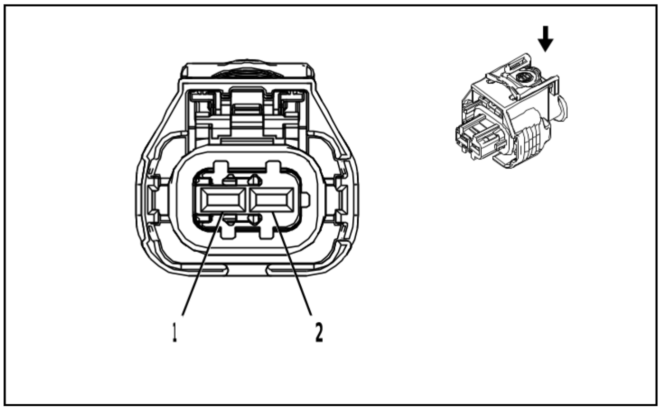
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q17B Fuel Injector 2 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / GY	(1) 4902	(1) Direct Fuel Injector High Voltage Supply Cylinder 2	(1) I	(1) —
(2) 2	(2) 0.75	(2) BU	(2) 4802	(2) Direct Fuel Injector High Voltage Control Cylinder 2	(2) I	(2) —

Q17C Fuel Injector 3 (L5P)



2845578

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13343445
- Service Connector: 19368140
- Description: 2-Way F 2.8 Series, Sealed(BK)

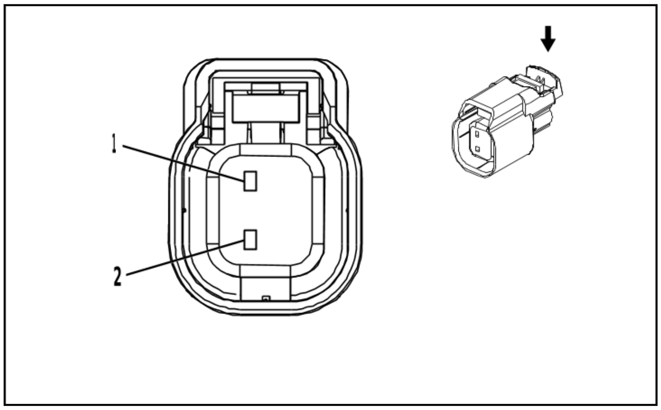
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q17C Fuel Injector 3 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN / GY	(1) 4903	(1) Direct Fuel Injector High Voltage Supply Cylinder 3	(1) I	(1) —
(2) 2	(2) 0.75	(2) GN	(2) 4803	(2) Direct Fuel Injector High Voltage Control Cylinder 3	(2) I	(2) —

Q17C Fuel Injector 3 (L8T)



2792100

Connector Part Information

- Harness Type: Fuel Injector Wiring Harness - Left
- OEM Connector: 340624008
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

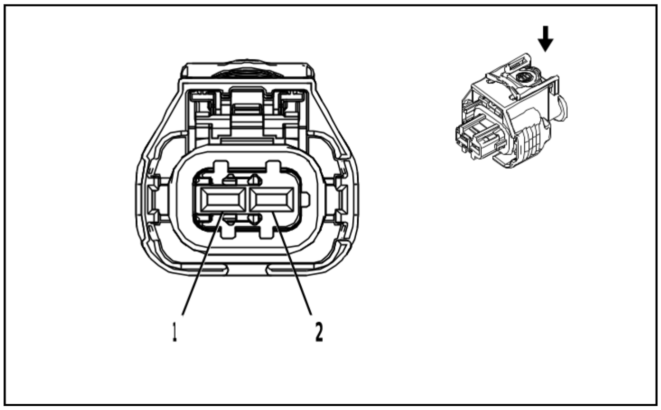
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q17C Fuel Injector 3 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN / GY	(1) 4903	(1) Direct Fuel Injector High Voltage Supply Cylinder 3	(1) I	(1) —
(2) 2	(2) 0.75	(2) GN	(2) 4803	(2) Direct Fuel Injector High Voltage Control Cylinder 3	(2) I	(2) —

Q17D Fuel Injector 4 (L5P)



2845578

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13343445
- Service Connector: 19368140
- Description: 2-Way F 2.8 Series, Sealed(BK)

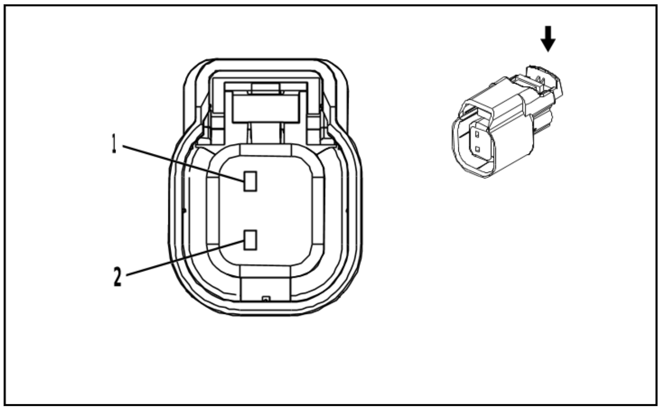
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q17D Fuel Injector 4 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / WH	(1) 4904	(1) Direct Fuel Injector High Voltage Supply Cylinder 4	(1) I	(1) —
(2) 2	(2) 0.75	(2) GY / BU	(2) 4804	(2) Direct Fuel Injector High Voltage Control Cylinder 4	(2) I	(2) —

Q17D Fuel Injector 4 (L8T)



2792100

Connector Part Information

- Harness Type: Fuel Injector Wiring Harness - Right
- OEM Connector: 340624008
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

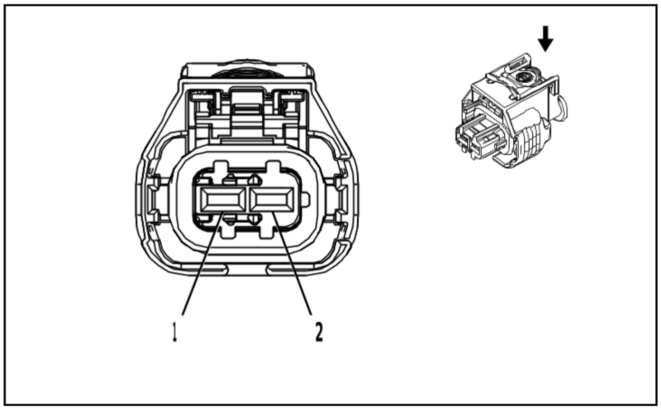
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q17D Fuel Injector 4 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / WH	(1) 4904	(1) Direct Fuel Injector High Voltage Supply Cylinder 4	(1) I	(1) —
(2) 2	(2) 0.75	(2) GY / BU	(2) 4804	(2) Direct Fuel Injector High Voltage Control Cylinder 4	(2) I	(2) —

Q17E Fuel Injector 5 (L5P)



2845578

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13343445
- Service Connector: 19368140
- Description: 2-Way F 2.8 Series, Sealed(BK)

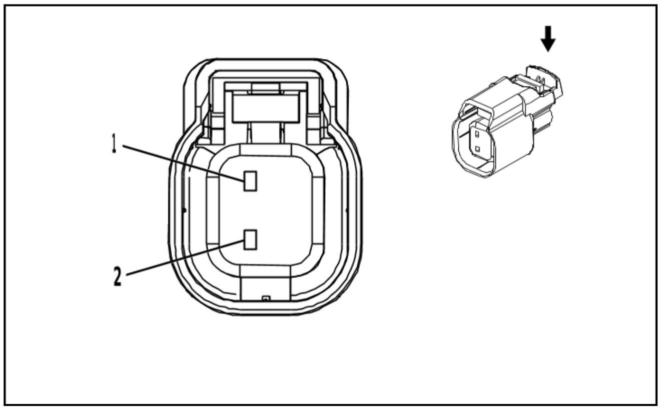
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q17E Fuel Injector 5 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN / WH	(1) 4905	(1) Direct Fuel Injector High Voltage Supply Cylinder 5	(1) I	(1) —
(2) 2	(2) 0.75	(2) WH / GN	(2) 4805	(2) Direct Fuel Injector High Voltage Control Cylinder 5	(2) I	(2) —

Q17E Fuel Injector 5 (L8T)



2792100

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Left
- OEM Connector: 340624008
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

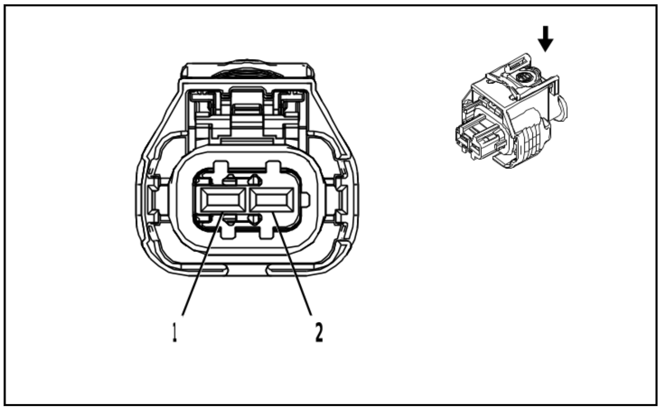
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q17E Fuel Injector 5 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN / WH	(1) 4905	(1) Direct Fuel Injector High Voltage Supply Cylinder 5	(1) I	(1) —
(2) 2	(2) 0.75	(2) WH / GN	(2) 4805	(2) Direct Fuel Injector High Voltage Control Cylinder 5	(2) I	(2) —

Q17F Fuel Injector 6 (L5P)



2845578

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13343445
- Service Connector: 19368140
- Description: 2-Way F 2.8 Series, Sealed(BK)

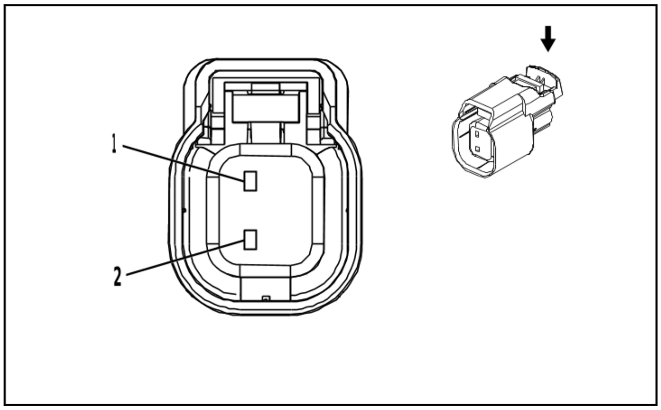
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q17F Fuel Injector 6 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / GY	(1) 4906	(1) Direct Fuel Injector High Voltage Supply Cylinder 6	(1) I	(1) —
(2) 2	(2) 0.75	(2) VT / GN	(2) 4806	(2) Direct Fuel Injector High Voltage Control Cylinder 6	(2) I	(2) —

Q17F Fuel Injector 6 (L8T)



2792100

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Right
- OEM Connector: 340624008
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

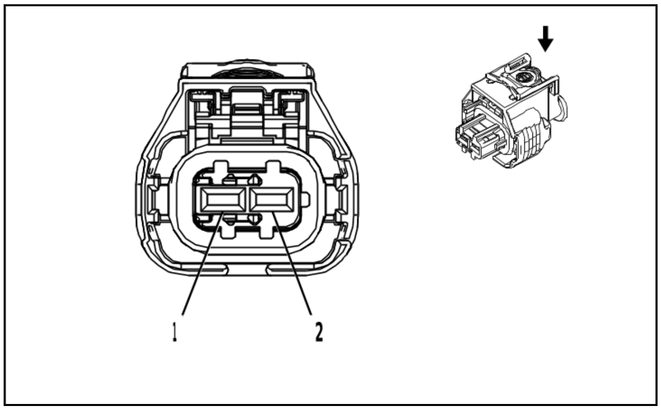
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q17F Fuel Injector 6 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) VT / GY	(1) 4906	(1) Direct Fuel Injector High Voltage Supply Cylinder 6	(1) I	(1) —
(2) 2	(2) 0.75	(2) VT / GN	(2) 4806	(2) Direct Fuel Injector High Voltage Control Cylinder 6	(2) I	(2) —

Q17G Fuel Injector 7 (L5P)



2845578

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13343445
- Service Connector: 19368140
- Description: 2-Way F 2.8 Series, Sealed(BK)

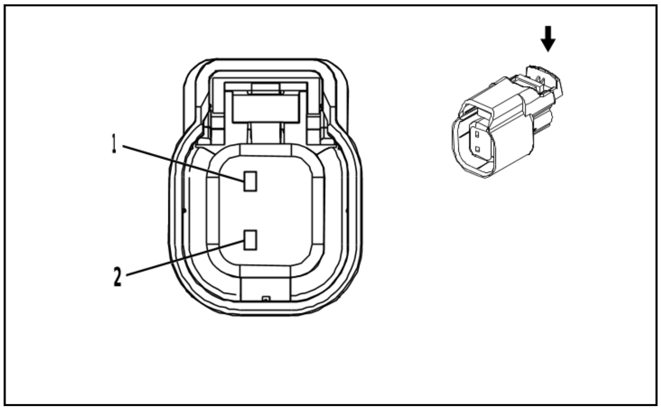
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q17G Fuel Injector 7 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) WH / YE	(1) 4907	(1) Direct Fuel Injector High Voltage Supply Cylinder 7	(1) I	(1) —
(2) 2	(2) 0.75	(2) YE / GY	(2) 4807	(2) Direct Fuel Injector High Voltage Control Cylinder 7	(2) I	(2) —

Q17G Fuel Injector 7 (L8T)



2792100

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Left
- OEM Connector: 340624008
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

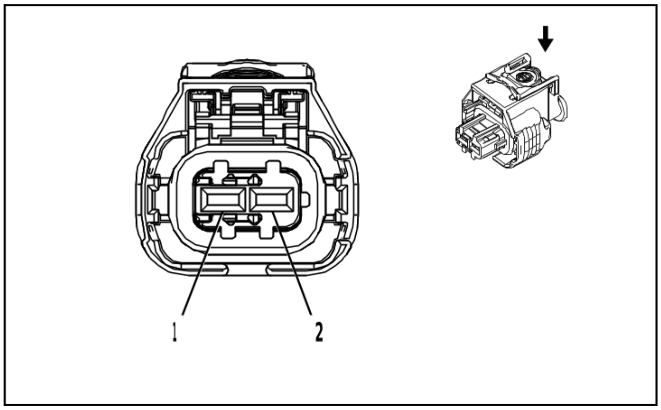
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q17G Fuel Injector 7 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) WH / YE	(1) 4907	(1) Direct Fuel Injector High Voltage Supply Cylinder 7	(1) I	(1) —
(2) 2	(2) 0.75	(2) YE / GY	(2) 4807	(2) Direct Fuel Injector High Voltage Control Cylinder 7	(2) I	(2) —

Q17H Fuel Injector 8 (L5P)



2845578

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13343445
- Service Connector: 19368140
- Description: 2-Way F 2.8 Series, Sealed(BK)

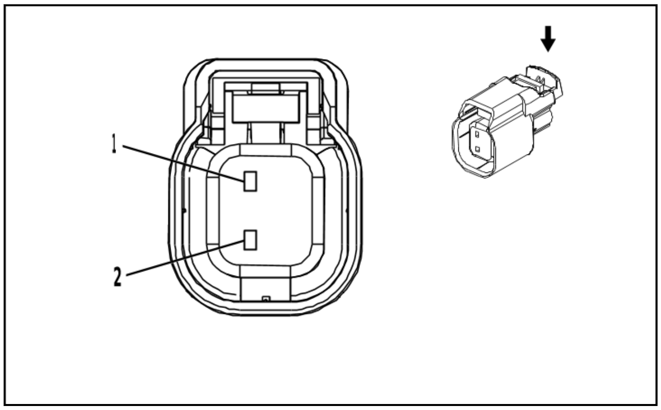
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q17H Fuel Injector 8 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75 (1) 0.75	(1) GY / WH (1) GY / BU	(1) 4908 (1) 4908	(1) Direct Fuel Injector High Voltage Supply Cylinder 8 (1) Direct Fuel Injector High Voltage Supply Cylinder 8	(1) I (1) I	(1) 1ST_ DESIGN (1) 2ND_ DESIGN
(2) 2	(2) 0.75	(2) GY	(2) 4808	(2) Direct Fuel Injector High Voltage Control Cylinder 8	(2) I	(2) —

Q17H Fuel Injector 8 (L8T)



2792100

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Right
- OEM Connector: 340624008
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 Series, Sealed(BK)

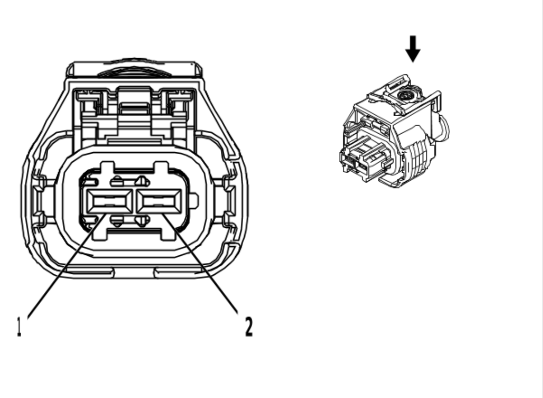
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q17H Fuel Injector 8 (L8T)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GY / WH	(1) 4908	(1) Direct Fuel Injector High Voltage Supply Cylinder 8	(1) I	(1) —
(2) 2	(2) 0.75	(2) GY	(2) 4808	(2) Direct Fuel Injector High Voltage Control Cylinder 8	(2) I	(2) —

Q18A Fuel Pressure Regulator 1 (L5P)



2577394

Connector Part Information

- Harness Type: Engine Wiring Jumper Harness
- OEM Connector: 13343443
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 2.8 Series, Sealed(BK)

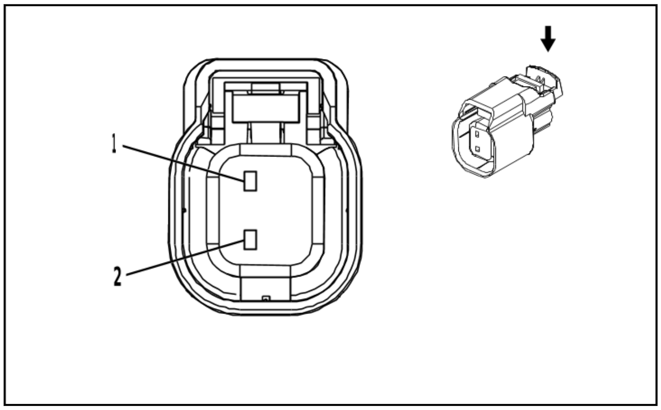
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

Q18A Fuel Pressure Regulator 1 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / BK	(1) 2929	(1) Fuel Metering Solenoid Valve Low Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE	(2) 2928	(2) Fuel Metering Solenoid Valve High Control	(2) I	(2) —

Q18B Fuel Pressure Regulator 2 (L5P)



2792100

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 13581410
- Service Connector: 19352068
- Description: 2-Way F 1.5 Series, Sealed(BK)

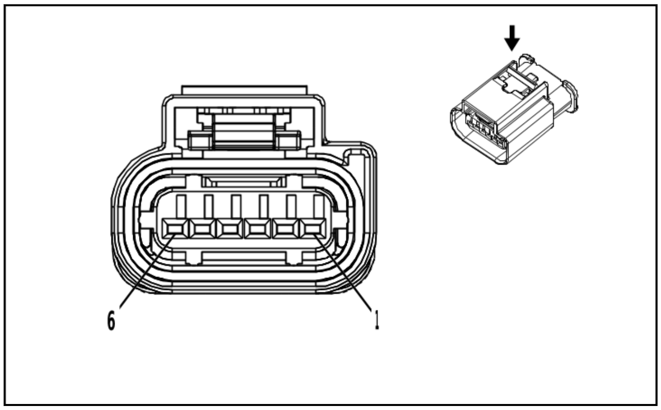
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q18B Fuel Pressure Regulator 2 (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU / WH	(1) 2530	(1) Fuel Rail Pressure Solenoid Valve Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 2834	(2) Fuel Rail Pressure Solenoid Valve Low Control	(2) I	(2) —

Q20 Intake Airflow Control Valve



3747579

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13507087
- Service Connector: 19352911
- Description: 6-Way F 1.2 MCON Series, Sealed(BK)

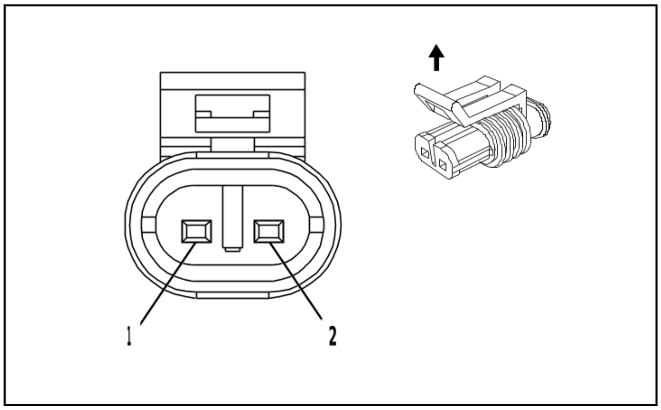
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q20 Intake Airflow Control Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE	(1) 581	(1) Throttle Actuator Open Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / WH	(2) 582	(2) Throttle Actuator Close Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / WH	(3) 3630	(3) Throttle Position Sensor SENT 1 Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / YE	(4) 548	(4) Engine Control Sensors Low Reference 1	(4) I	(4) —
(5) 5	(5) 0.5	(5) BU / RD	(5) 460	(5) Engine Control Sensors 5 Volt Reference 1	(5) I	(5) —
6	—	—	—	Not Occupied	—	—

Q32P Shift Solenoid Valve - Power Take-Off (NQF / NQH)



2448482

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 282080-1
- Service Connector: 88988136
- Description: 2-Way F 1.5 Series, Sealed(BK)

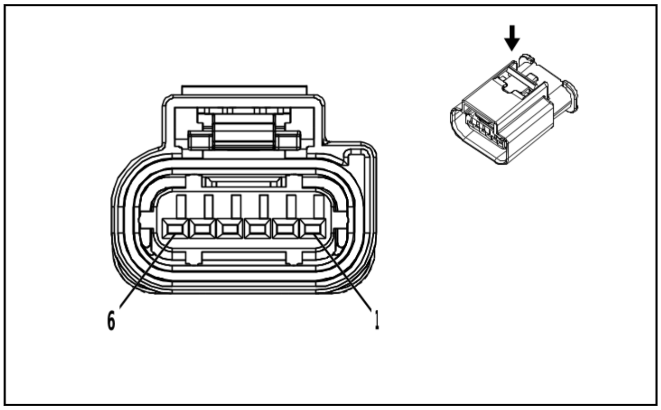
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

Q32P Shift Solenoid Valve - Power Take-Off (NQF / NQH)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU / WH	(1) 8235	(1) Power Take Off Solenoid Control High	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / WH	(2) 8236	(2) Power Take Off Solenoid Control Low	(2) I	(2) —

Q38 Throttle Body



3747579

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 2272975-5
- Service Connector: 19352911
- Description: 6-Way F 1.2 MCON Series, Sealed(BK)

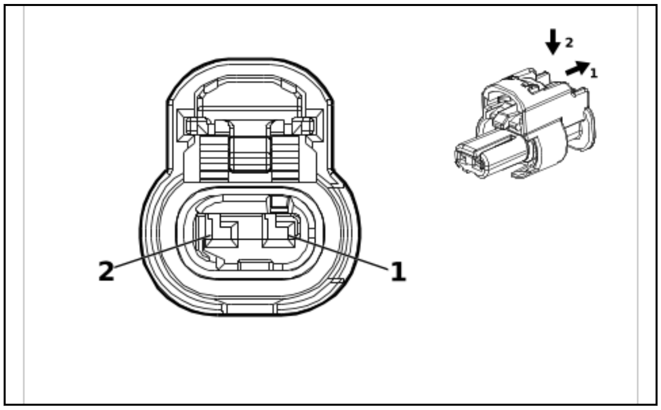
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q38 Throttle Body

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE	(1) 581	(1) Throttle Actuator Open Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / WH	(2) 582	(2) Throttle Actuator Close Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / WH	(3) 3630	(3) Throttle Position Sensor SENT 1 Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / BN	(4) 2752	(4) Throttle Position Sensor Low Reference	(4) I	(4) —
(5) 5	(5) 0.5	(5) BN / RD	(5) 2701	(5) Throttle Position Sensor 5V Reference	(5) I	(5) —
6	—	—	—	Not Occupied	—	—

Q44 Engine Oil Pressure Control Solenoid Valve



4036662

Connector Part Information
- Harness Type: Oil Pump Flow Control Solenoid Valve Wire
- OEM Connector: 1-2296704-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON-CB Series, Sealed(BK)

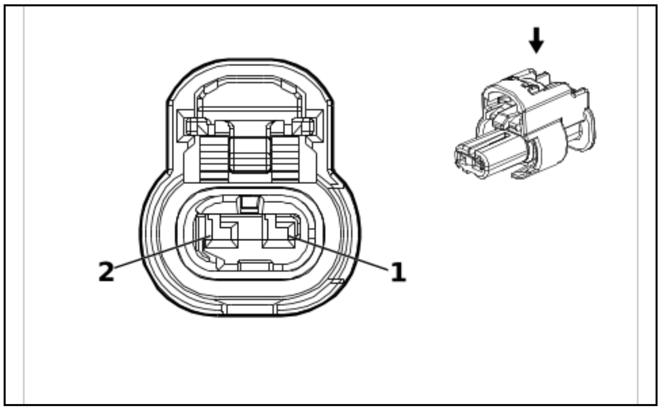
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

Q44 Engine Oil Pressure Control Solenoid Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BU	(1) 5293	(1) Powertrain Main Relay Fused Supply Voltage 4	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU	(2) 179	(2) Engine Oil Pump Control	(2) I	(2) —

Q46 Air Conditioning Compressor Solenoid Valve



4335931

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 1-2296694-2
- Service Connector: 19366843
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

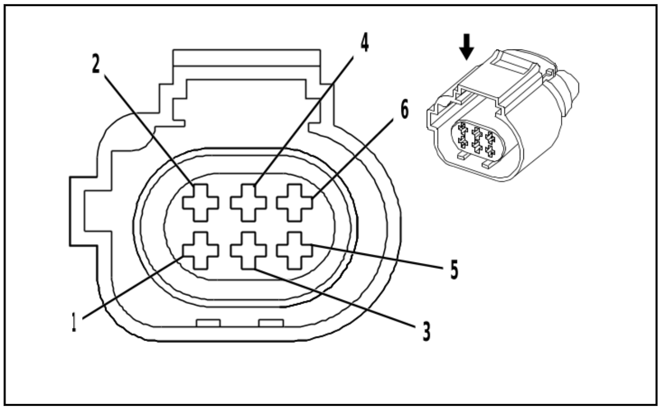
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

Q46 Air Conditioning Compressor Solenoid Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / YE	(1) 7574	(1) Air Conditioning Compressor Solenoid Valve Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) BU / BN	(2) 7573	(2) Air Conditioning Compressor Solenoid Valve Control	(2) I	(2) —

Q47 Exhaust Gas Recirculation Cooler Bypass Solenoid Valve



2216905

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 55571435
- Service Connector: 19354082
- Description: 6-Way F 1.6 Micro-Timer Series, Sealed(GY)

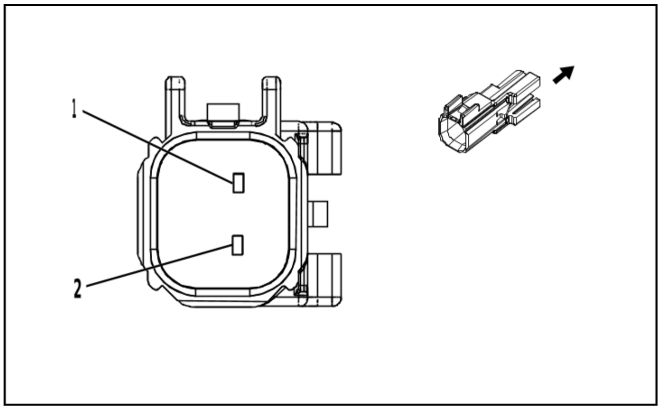
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

Q47 Exhaust Gas Recirculation Cooler Bypass Solenoid Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / VT	(1) 3656	(1) EGR Cooler Bypass Valve Close Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / GY	(2) 3654	(2) EGR Cooler Bypass Valve Position Sensor Signal	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.5	(4) BK / YE	(4) 548	(4) Engine Control Sensors Low Reference 1	(4) I	(4) —
(5) 5	(5) 0.5	(5) YE / GN	(5) 3655	(5) EGR Cooler Bypass Valve Open Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / RD	(6) 460	(6) Engine Control Sensors 5 Volt Reference 1	(6) I	(6) —

Q61 Reductant Fluid Injector (L5P)



3271068

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 34675-0003
- Service Connector: 19301583
- Description: 2-Way M 1.5 Series, Sealed(BK)

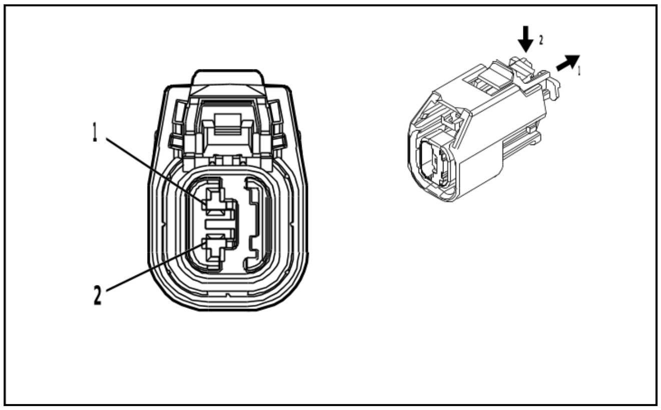
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-3 (GY)	No Tool Required

Q61 Reductant Fluid Injector (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / WH	(1) 3100	(1) Diesel Exhaust Fluid Dosing Valve Low Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN	(2) 3099	(2) Diesel Exhaust Fluid Dosing Valve High Control	(2) I	(2) —

Q64 Evaporative Emission System Switching Valve



4889830

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 33164011
- Service Connector: 86802964
- Description: 2-Way F 1.5 OCS Series, Sealed(BK)

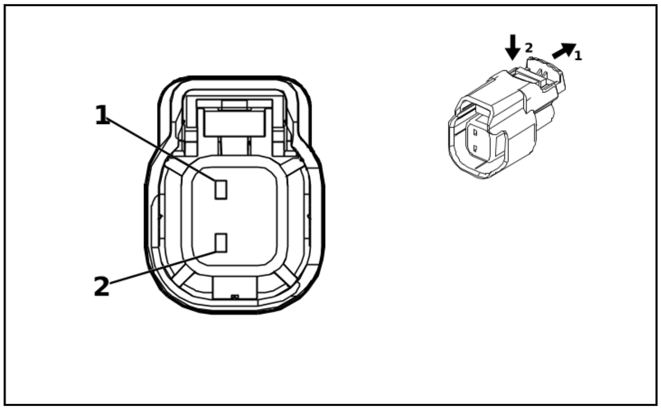
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

Q64 Evaporative Emission System Switching Valve

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BU	(1) 5294	(1) Powertrain Main Relay Fused Supply Voltage 5	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / RD	(2) 11031	(2) Fuel Tank Isolation Valve Supply Voltage	(2) I	(2) —

Q67 Exhaust Aftertreatment Fuel Injector - Chassis Cab (L5P)



5199958

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 34062-0025
- Service Connector: 13580230
- Description: 2-Way F 1.5 Series, Sealed(BK)

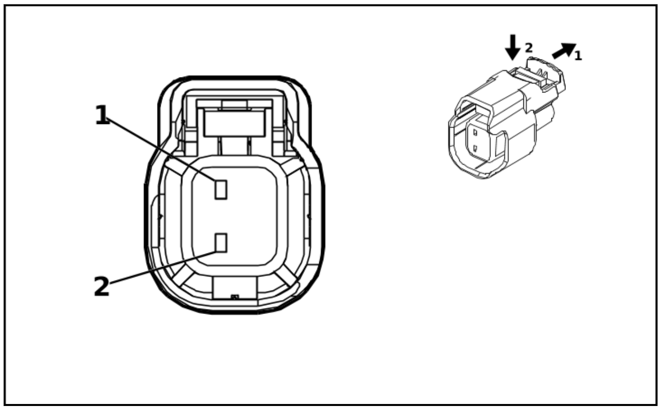
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q67 Exhaust Aftertreatment Fuel Injector - Chassis Cab (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BN	(1) 2927	(1) Exhaust Aftertreatment Fuel Injector Low Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / BU	(2) 2926	(2) Exhaust Aftertreatment Fuel Injector High Control	(2) I	(2) —

Q67 Exhaust Aftertreatment Fuel Injector - Pickup (L5P)



5199958

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 34062-4006
- Service Connector: 84769203
- Description: 2-Way F 1.5 Series, Sealed(BK)

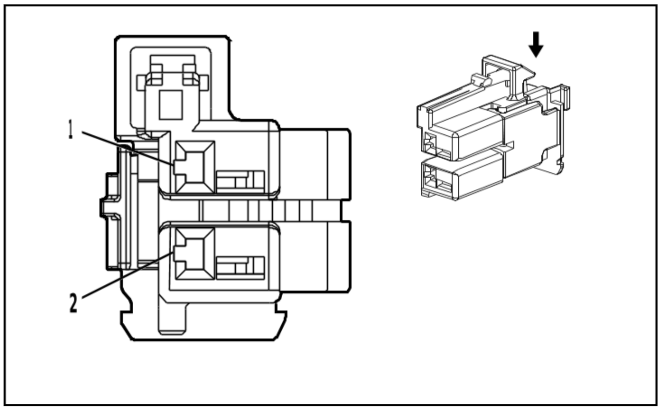
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

Q67 Exhaust Aftertreatment Fuel Injector - Pickup (L5P)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BN	(1) 2927	(1) Exhaust Aftertreatment Fuel Injector Low Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / BU	(2) 2926	(2) Exhaust Aftertreatment Fuel Injector High Control	(2) I	(2) —

Q77A Transmission Control Solenoid Valve 1



4672650

Connector Part Information

- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BN)

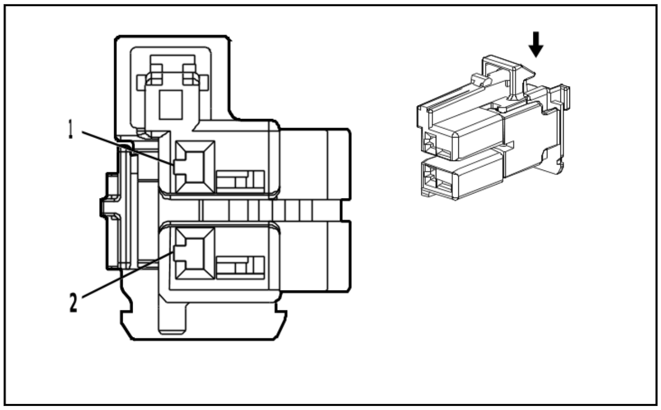
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q77A Transmission Control Solenoid Valve 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 6388	(1) Transmission High Side Driver 2 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / GN	(2) 6404	(2) Clutch Solenoid Valve E Control	(2) I	(2) —

Q77B Transmission Control Solenoid Valve 2



4672650

Connector Part Information

- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BN)

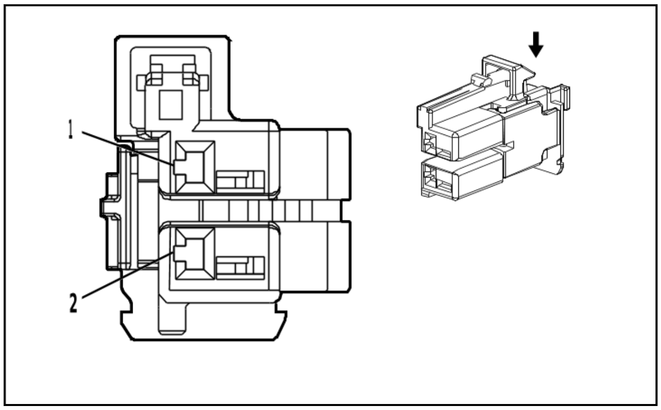
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q77B Transmission Control Solenoid Valve 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 6388	(1) Transmission High Side Driver 2 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / BN	(2) 6403	(2) Clutch Solenoid Valve D Control	(2) I	(2) —

Q77C Transmission Control Solenoid Valve 3



4672650

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BN)

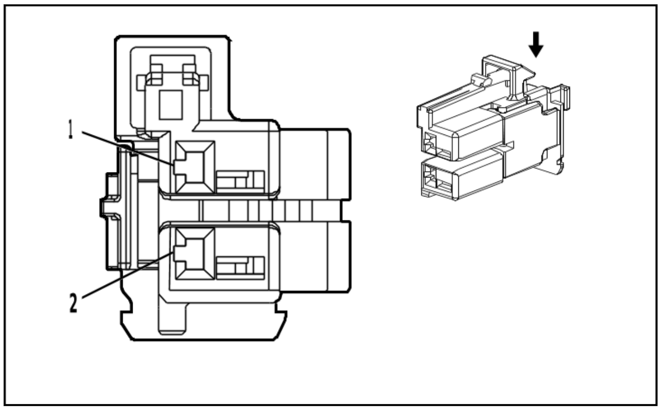
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q77C Transmission Control Solenoid Valve 3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 6388	(1) Transmission High Side Driver 2 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 6402	(2) Clutch Solenoid Valve C Control	(2) I	(2) —

Q77D Transmission Control Solenoid Valve 4



4672650

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BN)

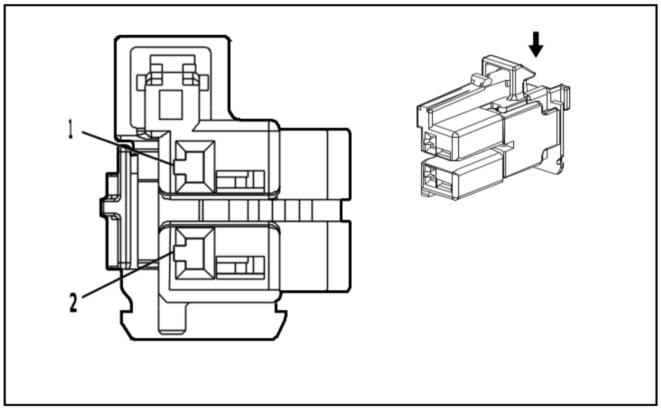
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q77D Transmission Control Solenoid Valve 4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 6388	(1) Transmission High Side Driver 2 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BN / WH	(2) 4509	(2) Transmission Clutch F Control	(2) I	(2) —

Q77E Transmission Control Solenoid Valve 5



4672650

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BN)

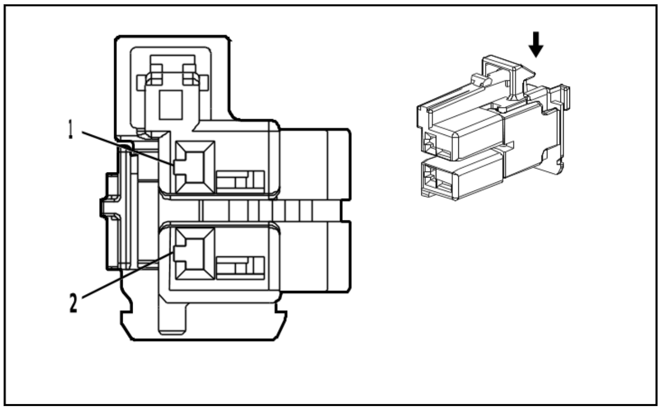
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q77E Transmission Control Solenoid Valve 5

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 6388	(1) Transmission High Side Driver 2 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / VT	(2) 4507	(2) Transmission Clutch H Control	(2) I	(2) —

Q77F Transmission Control Solenoid Valve 6



4672650

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BN)

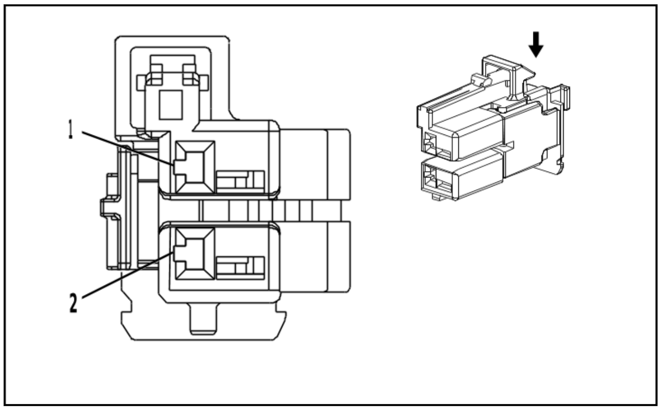
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q77F Transmission Control Solenoid Valve 6

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 6388	(1) Transmission High Side Driver 2 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / GY	(2) 4508	(2) Transmission Clutch G Control	(2) I	(2) —

Q77G Transmission Control Solenoid Valve 7



4364736

Connector Part Information

- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BU)

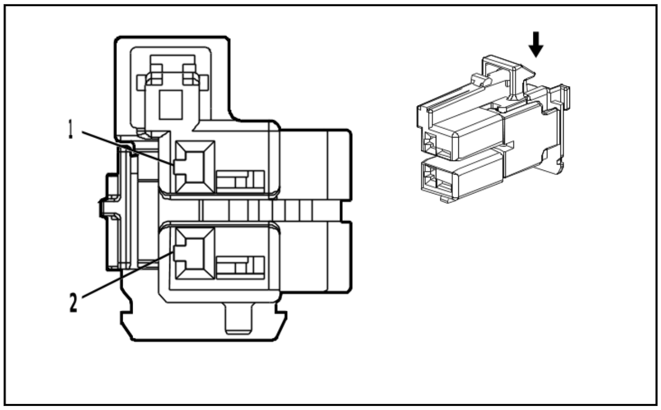
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q77G Transmission Control Solenoid Valve 7

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 6387	(1) Transmission High Side Driver 1 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / OG	(2) 1530	(2) Transmission Line Pressure Control Solenoid Valve Control	(2) I	(2) —

Q77H Transmission Control Solenoid Valve 8



4672683

Connector Part Information

- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2356394-3
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(GN)

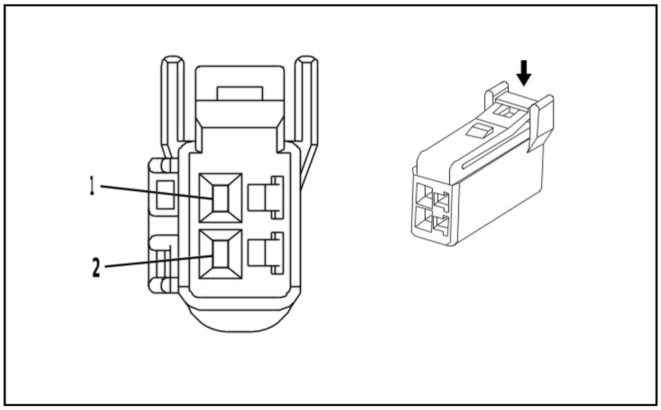
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

Q77H Transmission Control Solenoid Valve 8

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 6387	(1) Transmission High Side Driver 1 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY / BN	(2) 422	(2) Torque Converter Clutch Solenoid Valve Control	(2) I	(2) —

Q77J Transmission Control Solenoid Valve 9



4051682

Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 7287-0122
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 040 III Series(NA)

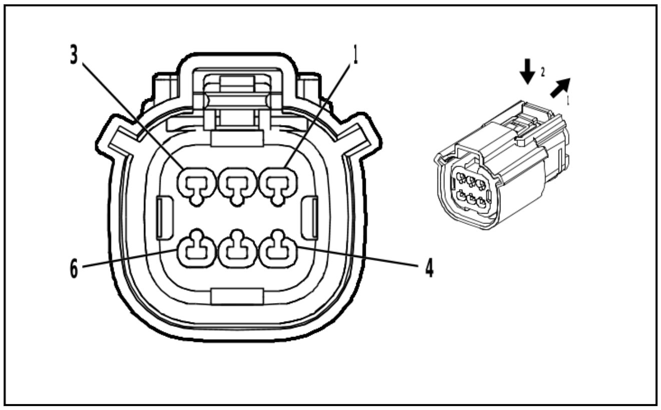
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

Q77J Transmission Control Solenoid Valve 9

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 6388	(1) Transmission High Side Driver 2 Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) VT	(2) 7819	(2) Default Disable Solenoid Control	(2) I	(2) —

Q85 Cooling Fan Clutch



4574736

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 33472-0681
- Service Connector: 13578533
- Description: 6-Way F 1.5 MX Series, Sealed(BK)

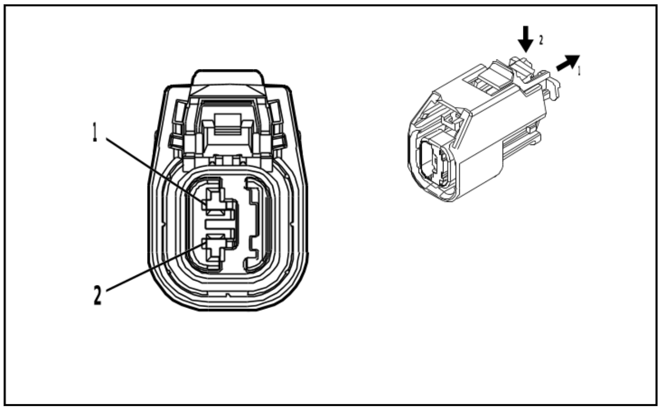
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

Q85 Cooling Fan Clutch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) BK	(1) 450	(1) Ground	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) WH	(3) 2368	(3) Cooling Fan Control Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / GY	(4) 626	(4) Engine Control Vehicle Sensors Low Reference 1	(4) I	(4) —
(5) 5	(5) 0.5	(5) BU / VT	(5) 2364	(5) Cooling Fan Speed Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) WH / RD	(6) 480	(6) Engine Control Vehicle Sensors 5 Volt Reference 1	(6) I	(6) —

R6A Terminating Resistor - High Speed Bus



4889830

Connector Part Information
- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 33164011
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.5 OCS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

R6A Terminating Resistor - High Speed Bus

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 4100	(1) AUTOSAR CAN Bus [-] 4 Serial Data	(1) I	(1) —
(2) 2	(2) 0.5	(2) BU / VT	(2) 4101	(2) AUTOSAR CAN Bus [+] 4 Serial Data	(2) I	(2) —

R12 Power Take-Off Switch Diode (PTO)

—

Connector Part Information
- Harness Type: PTO Harness
- OEM Connector: DID00000
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way

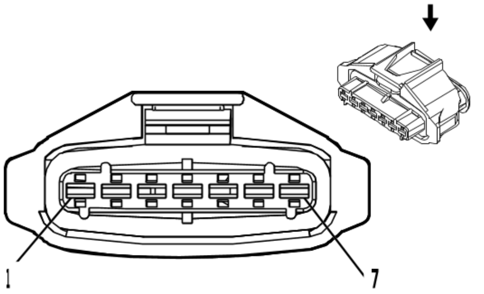
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

R12 Power Take-Off Switch Diode (PTO)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	—	BU / BN	4408	Power Take-Off Enable Signal	I	—
C	—	GY / GN	6239	Transmission Power Take-Off Engage/ Disengage Signal Power	I	—

R29 Fuel Filter



2537256

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 1928403222
- Service Connector: 19354080
- Description: 7-Way F 2.8 Junior Power Timer Series, Sealed(BK)

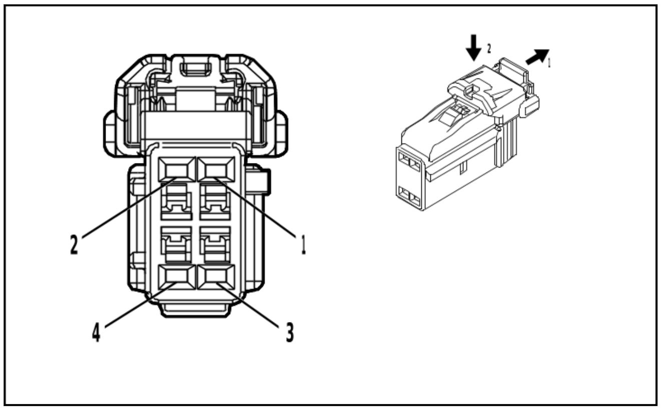
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

R29 Fuel Filter

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) BK / WH	(1) 1951	(1) Signal Ground	(1) I	(1) —
(2) 2	(2) 2.5	(2) BN / YE	(2) 2996	(2) Fuel Heater Control 1	(2) I	(2) —
(3) 3	(3) 1	(3) VT / GN	(3) 4320	(3) Powertrain Sensor Bus Enable	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / BU	(4) 6863	(4) Water In Fuel Sensor Low Reference	(4) I	(4) —
(5) 5	(5) 0.5	(5) BU / YE	(5) 6861	(5) Water In Fuel Sensor Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) BN / GY	(6) 7072	(6) Fuel Temperature Sensor 1 Signal	(6) I	(6) —
(7) 7	(7) 0.5	(7) BN / WH	(7) 7073	(7) Fuel Temperature Sensor 1 Low Reference	(7) I	(7) —

S3 Automatic Transmission Control



4872683

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8435
- Service Connector: 19369633
- Description: 4-Way F 1.2 Series(BK)

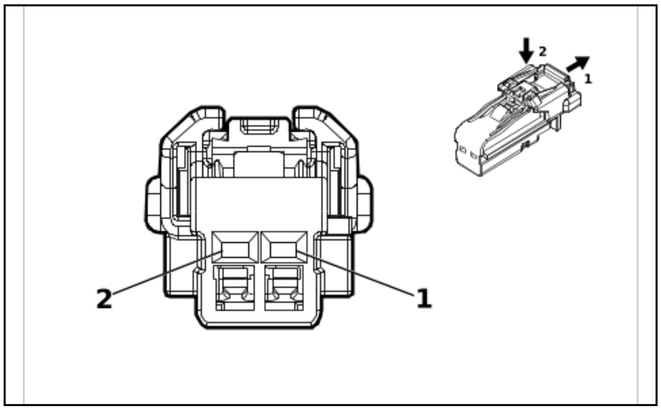
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required

S3 Automatic Transmission Control

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) YE / WH	(1) 816	(1) Brake Transmission Shift Interlock Solenoid Actuator Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1050	(2) Ground	(2) II	(2) —
(3) 3	(3) 0.35	(3) WH / VT	(3) 5905	(3) Key Capture/Column Lock Shift Position Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK	(4) 1050	(4) Ground	(4) II	(4) —

S3C Automatic Transmission Control Lever



4115691

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: 87816612
- Description: 2-Way F 1.2 MCON Series(BK)

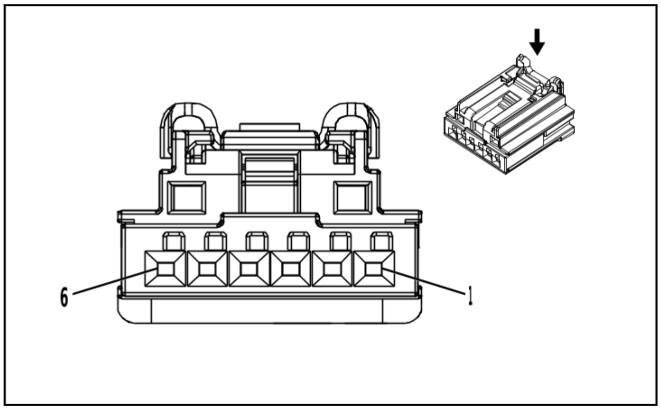
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

S3C Automatic Transmission Control Lever

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN / BU	(1) 3738	(1) Tap Up/Tap Down Switch Signal 2	(1) I	(1) —
(2) 2	(2) 0.35	(2) BK / WH	(2) 851	(2) Signal Ground	(2) I	(2) —

S13D Door Lock Switch - Driver (- (DLN / DBG / DWI / DZC))



4145138

Connector Part Information
- Harness Type: Front Side Door Door Lock Door Wiring Harness - Left
- OEM Connector: 2035363-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

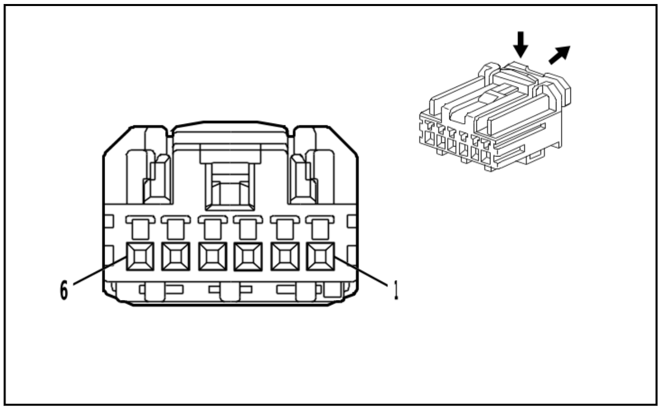
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S13D Door Lock Switch - Driver (- (DLN / DBG / DWI / DZC))

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / GY	(1) 4784	(1) Left Front Door LED Backlight Dimming Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) BN / YE	(3) 2771	(3) Left Front Door Lock Switch Lock Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BN / WH	(4) 2772	(4) Left Front Door Lock Switch Unlock Signal	(4) I	(4) —
(5) 5	(5) 0.5	(5) BK	(5) 1550	(5) Ground	(5) I	(5) —
6	—	—	—	Not Occupied	—	—

S13D Door Lock Switch - Driver (DLN / DBG / DWI / DZC)



4650256

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Left
- OEM Connector: HCMPB-C06A-K
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 HCM Series(BK)

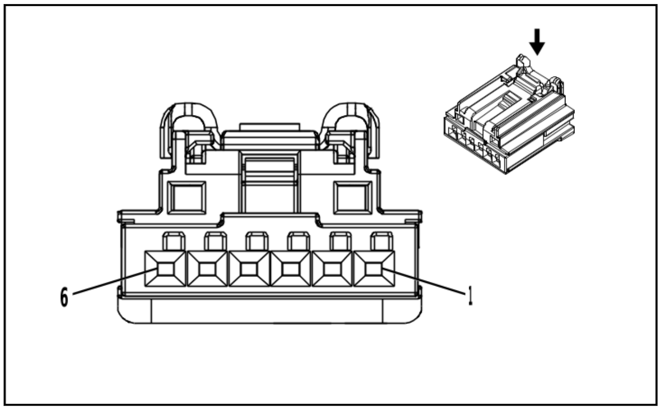
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S13D Door Lock Switch - Driver (DLN / DBG / DWI / DZC)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5 (1) 0.5	(1) YE (1) BN / GY	(1) 6817 (1) 4784	(1) LED Backlight Dimming Control 1 (1) Left Front Door LED Backlight Dimming Control	(1) I (1) I	(1) - (DLN/ DBG/ DWI) (1) DLN/ DBG/ DWI
(2) 2	(2) 0.5	(2) BN / YE	(2) 2771	(2) Left Front Door Lock Switch Lock Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BN / WH	(3) 2772	(3) Left Front Door Lock Switch Unlock Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK	(4) 1550	(4) Ground	(4) I	(4) —
5 - 6	—	—	—	Not Occupied	—	—

S13P Door Lock Switch - Passenger (- (DLN / DBG / DWI / DZC))



4145138

Connector Part Information
- Harness Type: Front Side Door Door Lock Door Wiring Harness - Right
- OEM Connector: 2035363-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

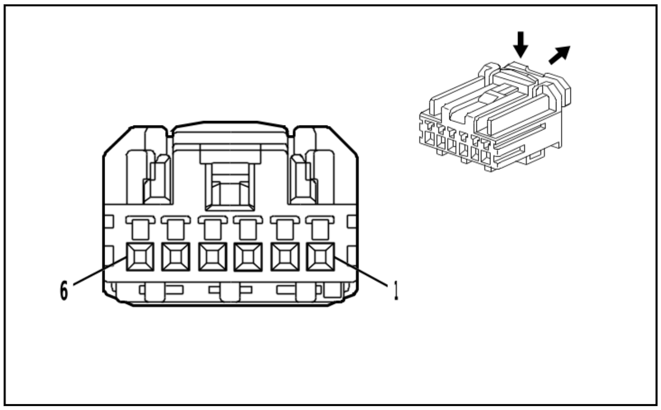
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S13P Door Lock Switch - Passenger (- (DLN / DBG / DWI / DZC))

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / VT	(1) 4638	(1) LED Backlight Dimming Control Right Front Door	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) YE / VT	(3) 2773	(3) Right Front Door Lock Switch Lock Control	(3) I	(3) —
(4) 4	(4) 0.5	(4) BN / VT	(4) 2774	(4) Right Front Door Lock Switch Unlock Control	(4) I	(4) —
(5) 5	(5) 0.5	(5) BK	(5) 1350	(5) Ground	(5) I	(5) —
6	—	—	—	Not Occupied	—	—

S13P Door Lock Switch - Passenger (DLN / DBG / DWI / DZC)



4650256

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Right
- OEM Connector: HCMPB-C06A-K
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 HCM Series(BK)

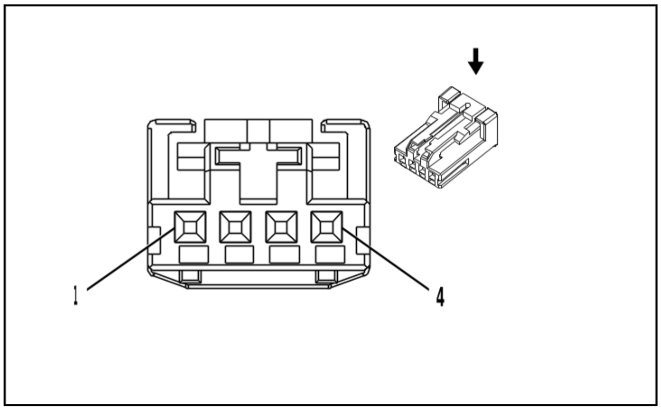
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S13P Door Lock Switch - Passenger (DLN / DBG / DWI / DZC)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5 (1) 0.5	(1) YE (1) GY / VT	(1) 6817 (1) 4638	(1) LED Backlight Dimming Control 1 (1) LED Backlight Dimming Control Right Front Door	(1) I (1) I	(1) - (DLN/ DBG/ DWI) (1) DLN/ DBG/ DWI
(2) 2	(2) 0.5	(2) YE / VT	(2) 2773	(2) Right Front Door Lock Switch Lock Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) BN / VT	(3) 2774	(3) Right Front Door Lock Switch Unlock Control	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK	(4) 1350	(4) Ground	(4) I	(4) —
5 - 6	—	—	—	Not Occupied	—	—

S27 Head-Up Display Switch



2717162

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 1-936119-1
- Service Connector: 19332889
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

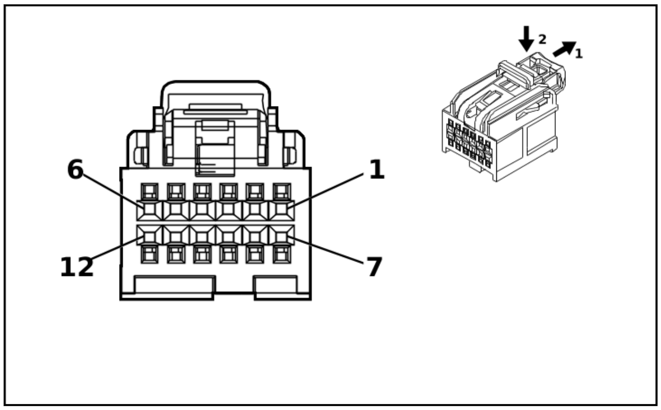
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S27 Head-Up Display Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) YE	(1) 6817	(1) LED Backlight Dimming Control 1	(1) I	(1) —
(2) 2	(2) 0.35	(2) BK / WH	(2) 851	(2) Signal Ground	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK / GN	(3) 5699	(3) Head-Up Display Switch Low Reference	(3) I	(3) —
(4) 4	(4) 0.35	(4) YE / WH	(4) 622	(4) Head-Up Display Switch Signal	(4) I	(4) —

S30 Headlamp Switch



4975223

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35016616
- Service Connector: 13519750
- Description: 12-Way F 0.64 OCS Series(BK)

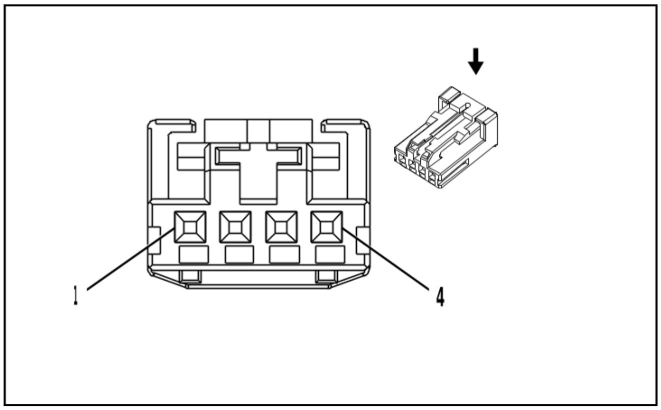
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19354230	J-35616-64B (L-BU)	J-38125-215A

S30 Headlamp Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) WH / VT	(1) 103	(1) Headlamp Switch On Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) YE	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) GN / BN	(3) 306	(3) Headlamp Switch Off Signal	(3) I	(3) —
(4) 4	(4) 0.35	(4) GY	(4) 158	(4) Cargo Lamp Switch Signal	(4) I	(4) —
(5) 5	(5) 0.35	(5) GN / GY	(5) 13	(5) Headlamp Switch Park Lamp Signal	(5) I	(5) —
(6) 6	(6) 0.35	(6) BU / GN	(6) 4248	(6) Cargo Lamp Indicator Control	(6) I	(6) —
(7) 7	(7) 0.35	(7) WH / GY	(7) 2935	(7) Task Lamp Switch Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) BK / WH	(8) 851	(8) Signal Ground	(8) I	(8) —
9 - 10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.35	(11) WH / BN	(11) 7555	(11) Headlamp Switch Signal	(11) I	(11) —
(12) 12	(12) 0.35	(12) YE	(12) 7556	(12) Headlamp Switch Reference	(12) I	(12) —

S32R Rear Seat Heater Switch



2717162

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 1-936119-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

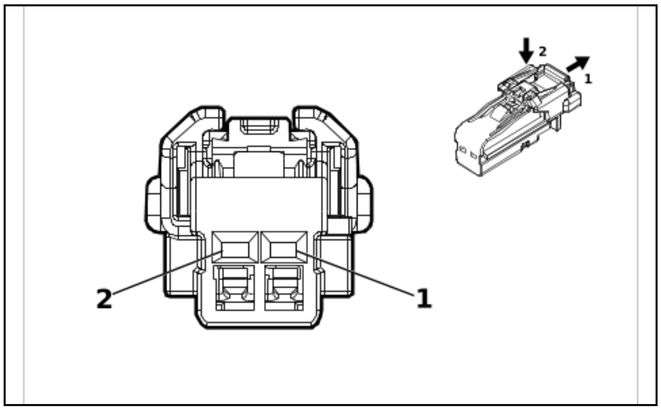
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S32R Rear Seat Heater Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / BU	(1) 1240	(1) Battery Positive Voltage	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) GN / VT	(3) 2857	(3) Body Control Module LIN Bus 11	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / WH	(4) 1451	(4) Signal Ground	(4) I	(4) —

S33 Steering Wheel Horn Contact (- K34)



4115691

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

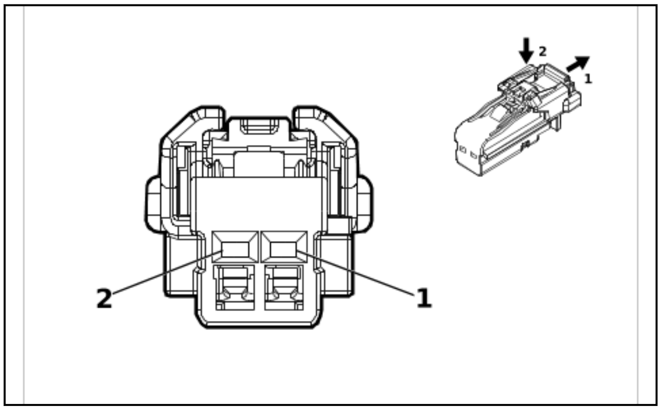
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

S33 Steering Wheel Horn Contact (- K34)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK	(1) 6051	(1) Steering Wheel Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) RD	(2) 3287	(2) Horn Switch Signal	(2) I	(2) —

S33 Steering Wheel Horn Contact (K34)



4115691

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 6098-8431
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 Series(BK)

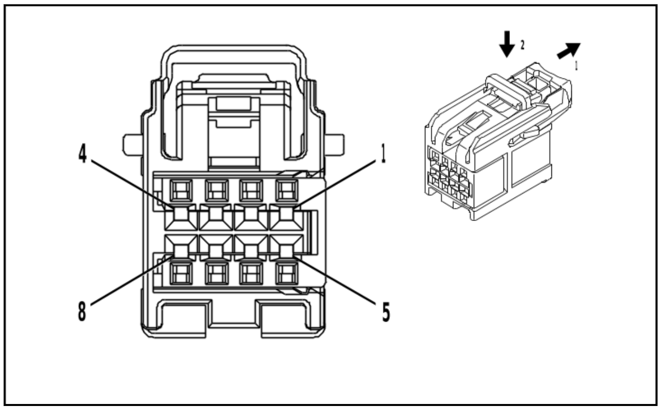
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

S33 Steering Wheel Horn Contact (K34)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK / WH	(1) 6051	(1) Steering Wheel Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) GN / WH	(2) 3287	(2) Horn Switch Signal	(2) I	(2) —

S38 On/Off Vehicle Switch



4232228

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 15526973
- Service Connector: 19353873
- Description: 8-Way F 0.64 OCS Series(GY)

Terminal Part Information

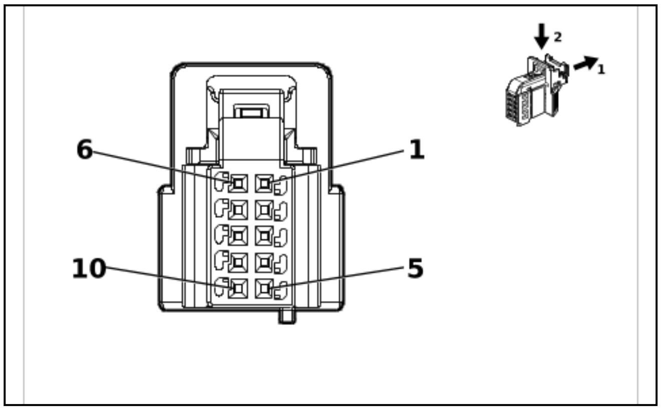
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S38 On/Off Vehicle Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BU / BK	(1) 5719	(1) Ignition Mode Switch Start LED Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) BN / BK	(2) 5720	(2) Ignition Mode Switch Accessory LED Signal	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK / WH	(3) 851	(3) Signal Ground	(3) I	(3) —
(4) 4	(4) 0.35	(4) BU / GN	(4) 5723	(4) Ignition Mode Switch Mode Voltage	(4) I	(4) —
(5) 5	(5) 0.35	(5) YE	(5) 6817	(5) LED Backlight Dimming Control 1	(5) I	(5) —
6	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(7) 7	(7) 0.35	(7) BK / GY	(7) 3559	(7) Passive Start Switch 2 Low Reference	(7) I	(7) —
(8) 8	(8) 0.35	(8) GN / BK	(8) 3558	(8) Passive Start Switch Signal 2	(8) I	(8) —

S47D Front Seat Adjuster Memory Switch - Driver



5838155

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Left
- OEM Connector: 2310000-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 0.64 MQS Series(BK)

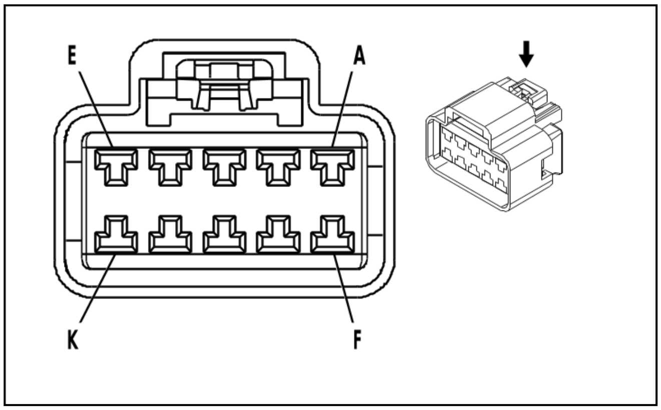
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S47D Front Seat Adjuster Memory Switch - Driver

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / GY	(1) 4784	(1) Left Front Door LED Backlight Dimming Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) BN / YE	(3) 2771	(3) Left Front Door Lock Switch Lock Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) BN / WH	(4) 2772	(4) Left Front Door Lock Switch Unlock Signal	(4) I	(4) —
(5) 5	(5) 0.5	(5) BK / WH	(5) 1551	(5) Signal Ground	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / GN	(6) 614	(6) Seat Memory Switch Set Signal	(6) I	(6) —
(7) 7	(7) 0.5	(7) WH	(7) 615	(7) Seat Memory Switch Signal 1	(7) I	(7) —
8 - 10	—	—	—	Not Occupied	—	—

S64D Front Seat Adjuster Switch - Driver (A2X - A45)



623046

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 35058909
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 280 GT Series(BK)

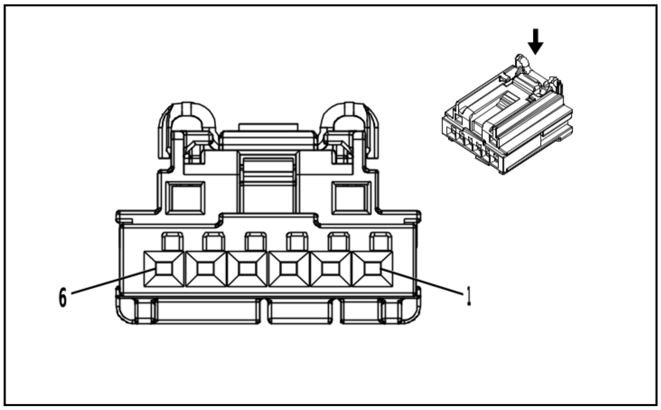
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

S64D Front Seat Adjuster Switch - Driver (A2X - A45)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	2.5	RD / YE	5040	Battery Positive Voltage	I	—
B	1.5	BU / YE	277	Driver Seat Recline Motor Rearward Control	I	—
C	1.5	YE / BU	285	Driver Seat Horizontal Motor Forward Control	I	—
D	1.5	GY / GN	284	Driver Seat Horizontal Motor Rearward Control	I	—
E	1.5	GY / BU	283	Driver Seat Rear Vertical Motor Down Control	I	—
F	1.5	GN / BN	286	Driver Seat Front Vertical Motor Up Control	I	—
G	1.5	YE	282	Driver Seat Rear Vertical Motor Up Control	I	—
H	1.5	GN / YE	276	Driver Seat Recline Motor Forward Control	I	—
J	2.5	BK	1550	Ground	I	—
K	1.5	BU / VT	287	Driver Seat Front Vertical Motor Down Control	I	—

S64D Front Seat Adjuster Switch - Driver (A45)



3960313

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 2035363-4
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

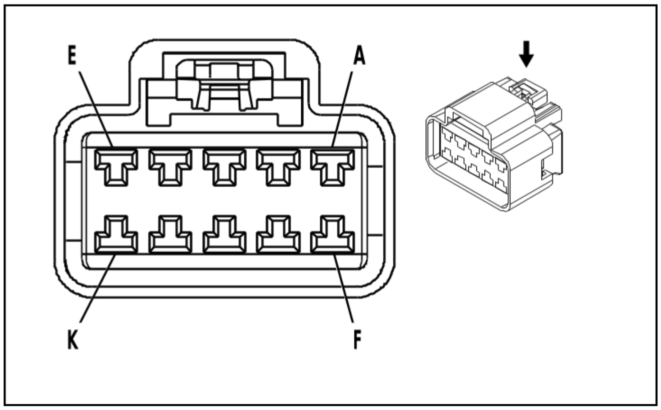
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S64D Front Seat Adjuster Switch - Driver (A45)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / BN	(1) 2240	(1) Battery Positive Voltage	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35 (3) 0.5	(3) GN / GY (3) GN / GY	(3) 3758 (3) 3758	(3) Driver Seat Adjuster Memory Module LIN Bus 2 (3) Driver Seat Adjuster Memory Module LIN Bus 2	(3) I (3) I	(3) — (3) —
(4) 4	(4) 0.5	(4) BK	(4) 1550	(4) Ground	(4) I	(4) —
(5) 5	(5) 0.5	(5) BU / YE	(5) 2818	(5) Driver Seat Auxiliary Adjustment Switch Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) BK / VT	(6) 2817	(6) Auxiliary Driver Seat Adjustment Switch Low Reference	(6) I	(6) —

S64P Front Seat Adjuster Switch - Passenger (A7K)



623046

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 35058909
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 280 GT Series(BK)

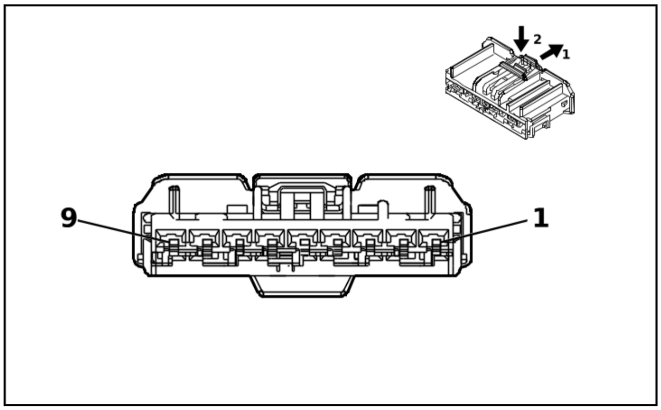
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

S64P Front Seat Adjuster Switch - Passenger (A7K)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	1.5	BU / WH	289	Passenger Seat Rear Vertical Motor Down Control	I	—
B	1.5	YE / BU	290	Passenger Seat Horizontal Motor Rearward Control	I	—
C	1.5	YE / WH	296	Passenger Seat Horizontal Motor Forward Control	I	—
D	1.5	BU / BN	77	Passenger Seat Recline Motor Rearward Control	I	—
E	2.5	BK	1350	Ground	I	—
F	1.5	GN / BU	298	Passenger Seat Front Vertical Motor Down Control	I	—
G	2.5	RD / GY	7440	Battery Positive Voltage	I	—
H	1.5	GN	76	Passenger Seat Recline Motor Forward Control	I	—
J	1.5	GN / WH	288	Passenger Seat Rear Vertical Motor Up Control	I	—
K	1.5	GN / VT	297	Passenger Seat Front Vertical Motor Up Control	I	—

S65D Front Seat Lumbar Switch - Driver (A2X)



5204289

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 7289-6875-40
- Service Connector: Service by Harness - See Part Catalog
- Description: 9-Way F 2.8 YESC Series(GY)

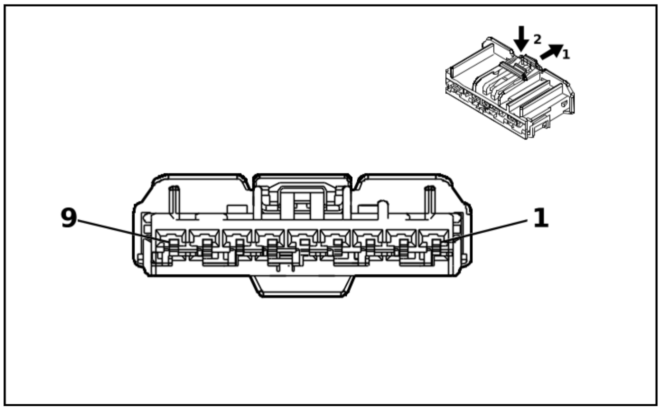
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

S65D Front Seat Lumbar Switch - Driver (A2X)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 1550	(1) Ground	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.75	(3) RD / BN	(3) 2240	(3) Battery Positive Voltage	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.75	(5) BU	(5) 611	(5) Driver Seat Lumbar Support Motor Forward Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.75	(7) VT	(7) 610	(7) Driver Seat Lumbar Support Motor Backward Control	(7) I	(7) —
8 - 9	—	—	—	Not Occupied	—	—

S65P Front Seat Lumbar Switch - Passenger (A7K)



5204289

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 7289-6875-40
- Service Connector: Service by Harness - See Part Catalog
- Description: 9-Way F 2.8 YESC Series(GY)

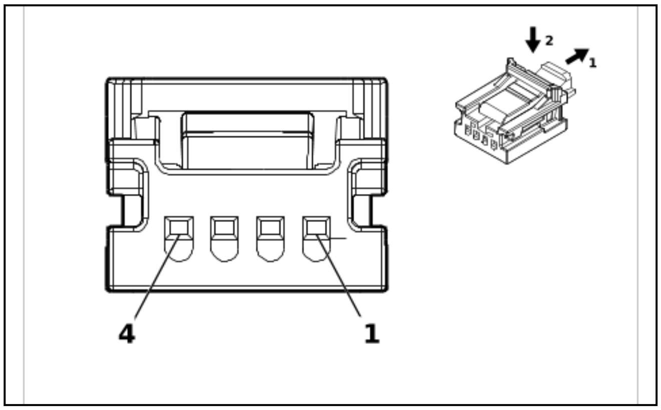
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

S65P Front Seat Lumbar Switch - Passenger (A7K)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 1350	(1) Ground	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.75	(3) RD / BN	(3) 2240	(3) Battery Positive Voltage	(3) I	(3) —
4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.75	(5) BU	(5) 211	(5) Passenger Seat Lumbar Support Motor Forward Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.75	(7) VT	(7) 210	(7) Passenger Seat Lumbar Support Motor Backward Control	(7) I	(7) —
8 - 9	—	—	—	Not Occupied	—	—

S70E Radio Favorites Switch - Steering Wheel



5493278

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 34791-5140
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F Mini 50 Series(BK)

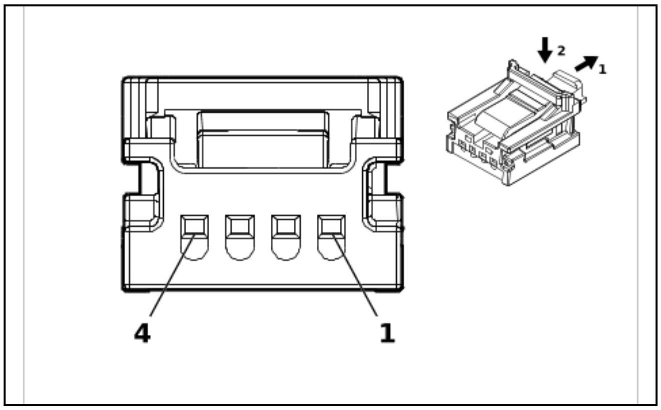
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required

S70E Radio Favorites Switch - Steering Wheel

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK	(1) 6051	(1) Steering Wheel Ground	(1) I	(1) UK3
(2) 2	(2) 0.35	(2) BU / RD	(2) 4313	(2) Radio Favorite Forward Switch Signal	(2) I	(2) —
(3) 3	(3) 0.35	(3) BU / RD	(3) 4312	(3) Radio Favorite Back Switch Signal	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

S70F Radio Volume Switch - Steering Wheel



5493584

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 34791-5141
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F Mini 50 Series(GY)

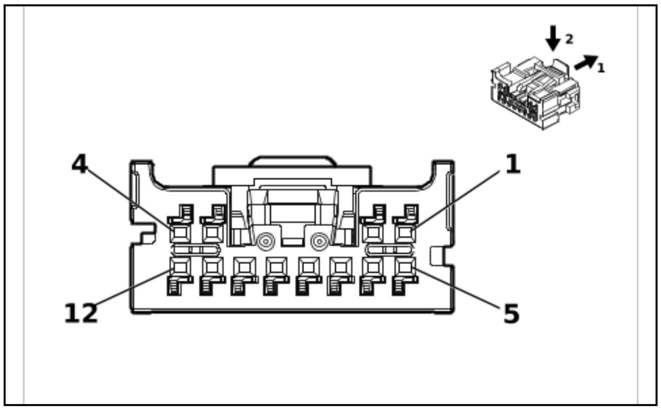
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required

S70F Radio Volume Switch - Steering Wheel

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK	(1) 6051	(1) Steering Wheel Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) GN / RD	(2) 4314	(2) Radio Volume Down Switch Signal	(2) I	(2) —
(3) 3	(3) 0.35	(3) OG / RD	(3) 4315	(3) Radio Volume Up Switch Signal	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

S70L Cruise Control Switch (KI3 + K34)



5823893

Connector Part Information
- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 206523-2122
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way F Mini 50 Series(GY)

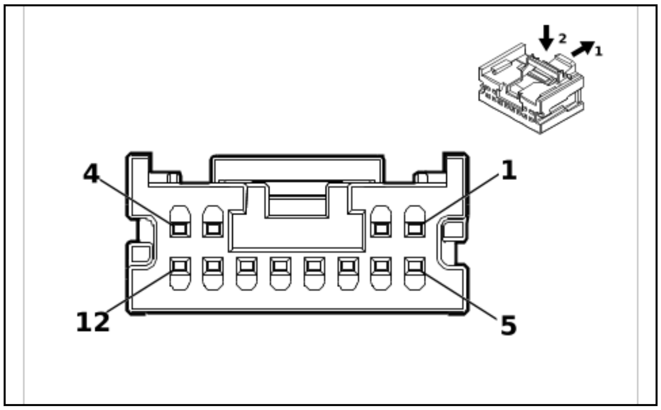
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required

S70L Cruise Control Switch (KI3 + K34)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN	(1) 5140	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.35	(2) PK	(2) 3893	(2) Steering Wheel LED Backlight Dimming Control	(2) I	(2) —
(3) 3	(3) 0.35	(3) GN / OG	(3) 1884	(3) Cruise Control Set/Coast/Resume/Accelerate Switch Signal	(3) I	(3) —
(4) 4	(4) 0.35	(4) VT	(4) 5737	(4) Distance Sensing Cruise Control Gap Up/ Down Switch Signal	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.35	(6) BK	(6) 6051	(6) Steering Wheel Ground	(6) I	(6) —
(7) 7	(7) 0.35	(7) GY / OG	(7) 5884	(7) Steering Wheel Heating Switch LED Control	(7) I	(7) —
(8) 8	(8) 0.35	(8) GN	(8) 5883	(8) Steering Wheel Heating Switch Signal	(8) I	(8) —
(9) 9	(9) 0.35	(9) BK / RD	(9) 3892	(9) Indicator Dimming Control 2	(9) I	(9) —
(10) 10	(10) 0.35	(10) BU	(10) 1449	(10) Steering Wheel Resistor Ladder Low Reference	(10) I	(10) —
11 - 12	—	—	—	Not Occupied	—	—

S70L Cruise Control Switch (K34)



4539608

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 34824-5125
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way F Mini 50 Series(GY)

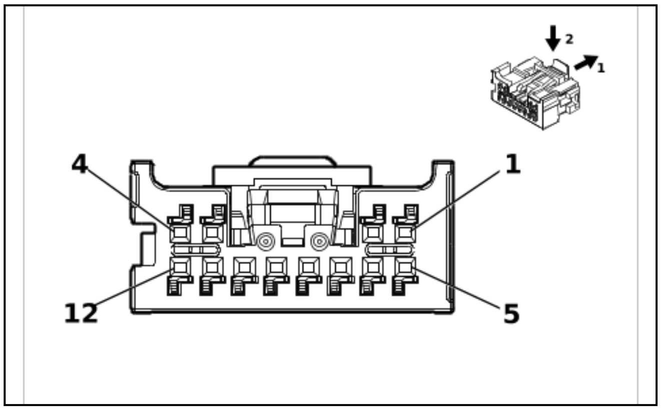
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required

S70L Cruise Control Switch (K34)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) RD / GN	(1) 5140	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.35	(2) PK	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) BN / GN	(3) 1884	(3) Cruise Control Set/Coast/Resume/Accelerate Switch Signal	(3) I	(3) —
(4) 4	(4) 0.35	(4) GY / GN	(4) 5737	(4) Distance Sensing Cruise Control Gap Up/ Down Switch Signal	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.35	(6) BK	(6) 6051	(6) Steering Wheel Ground	(6) I	(6) —
7 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.35	(10) BK / VT	(10) 1449	(10) Steering Wheel Resistor Ladder Low Reference	(10) I	(10) —
11 - 12	—	—	—	Not Occupied	—	—

S70R Radio Control Switch - Steering Wheel



5911307

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 206523-2123
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way F Mini 50 Series(GY)

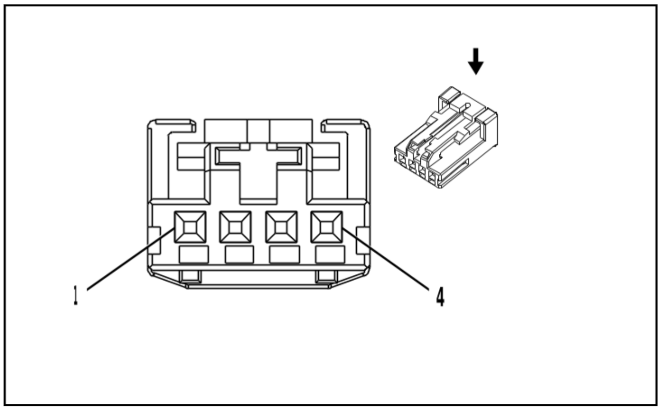
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	EL-35616-58 (BK)	No Tool Required

S70R Radio Control Switch - Steering Wheel

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN	(1) 5140	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.35	(2) PK	(2) 3893	(2) Steering Wheel LED Backlight Dimming Control	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK / BU	(3) 3894	(3) Instrument Panel Cluster Control Module LIN Bus 1	(3) I	(3) —
4 - 5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.35	(6) BK	(6) 6051	(6) Steering Wheel Ground	(6) I	(6) —
(7) 7	(7) 0.35	(7) BU / RD	(7) 4313	(7) Radio Favorite Forward Switch Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) BU / RD	(8) 4312	(8) Radio Favorite Back Switch Signal	(8) I	(8) —
(9) 9	(9) 0.35	(9) BK / RD	(9) 3892	(9) Indicator Dimming Control 2	(9) I	(9) —
(10) 10	(10) 0.35	(10) OG / RD	(10) 4315	(10) Radio Volume Up Switch Signal	(10) I	(10) —
(11) 11	(11) 0.35	(11) GN / RD	(11) 4314	(11) Radio Volume Down Switch Signal	(11) I	(11) —
12	—	—	—	Not Occupied	—	—

S76 Trailer Brake Control Switch (- (GFG / GFW / GFY / GA4))



2717162

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 1-936119-1
- Service Connector: 19332889
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

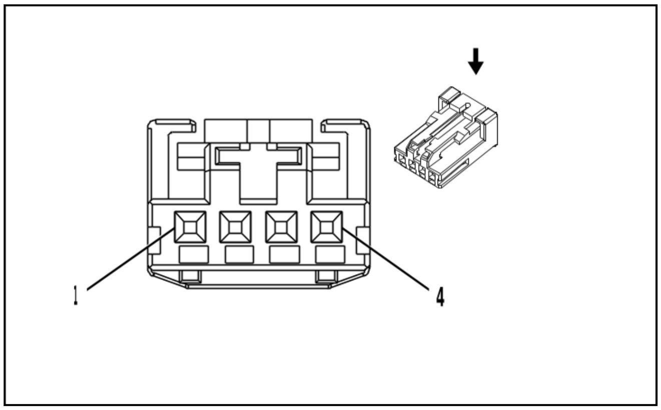
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S76 Trailer Brake Control Switch (- (GFG / GFW / GFY / GA4))

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / YE	(1) 2340	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.35	(2) GN / BU	(2) 2733	(2) Brake System Control Module LIN Bus 2	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK	(3) 1050	(3) Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

S76 Trailer Brake Control Switch (GFG / GFW / GFY / GA4)



2717162

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 1-936119-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

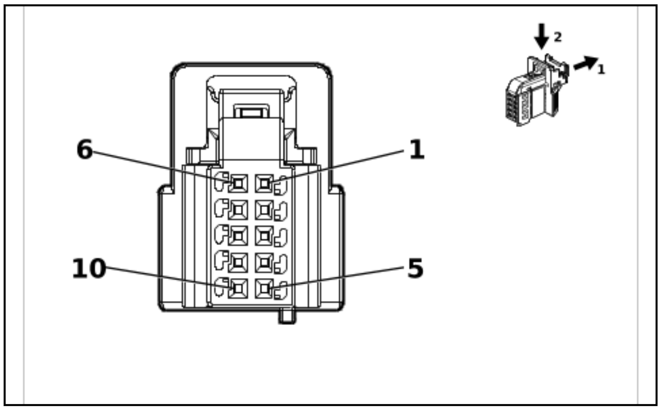
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S76 Trailer Brake Control Switch (GFG / GFW / GFY / GA4)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / YE	(1) 2340	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.35	(2) GN / BU	(2) 2733	(2) Brake System Control Module LIN Bus 2	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK	(3) 1350	(3) Ground	(3) I	(3) —
4	—	—	—	Not Occupied	—	—

S78 Turn Signal Switch



5838155

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 2310000-1
- Service Connector: 13518417
- Description: 10-Way F 0.64 MQS Series(BK)

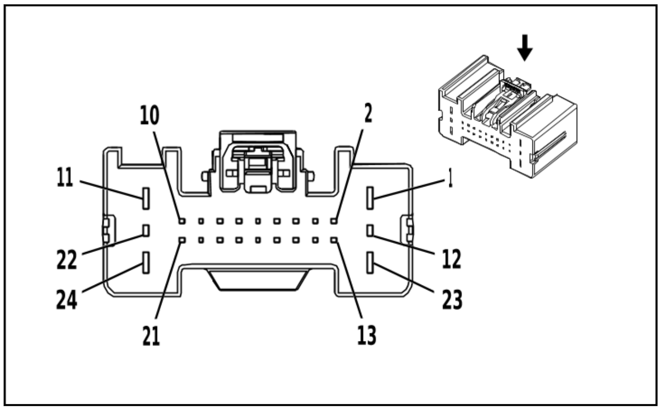
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19300632	J-35616-64B (L-BU)	J-38125-215A

S78 Turn Signal Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) WH / GN	(1) 2915	(1) Left Turn Signal Switch Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) VT / BU	(2) 2916	(2) Right Turn Signal Switch Signal	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK / WH	(3) 851	(3) Signal Ground	(3) I	(3) —
(4) 4	(4) 0.35	(4) GY / BN	(4) 3904	(4) Auto High Beam Assist Switch Signal	(4) I	(4) —
(5) 5	(5) 0.35	(5) WH / BK	(5) 94	(5) Windshield Washer Switch Signal	(5) I	(5) —
(6) 6	(6) 0.35	(6) YE / BN	(6) 307	(6) Headlamp Switch Flash Signal	(6) I	(6) —
(7) 7	(7) 0.35	(7) WH	(7) 524	(7) High Beam Select Switch High Beam Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) BK / GY	(8) 6009	(8) Windshield Wiper Switch Low Reference	(8) I	(8) —
(9) 9	(9) 0.35	(9) GY	(9) 1715	(9) Windshield Wiper Switch High Signal	(9) I	(9) —
(10) 10	(10) 0.35	(10) YE / BU	(10) 1714	(10) Windshield Wiper Switch Low Signal	(10) I	(10) —

S79D Front Side Door Window Control Switch - Driver X1



2871905

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Left
- OEM Connector: 7287-3260-30
- Service Connector: Service by Harness - See Part Catalog
- Description: 24-Way F 0.64 GEN-Y, 1.5, 2.8 YESC Series(BK)

Terminal Part Information

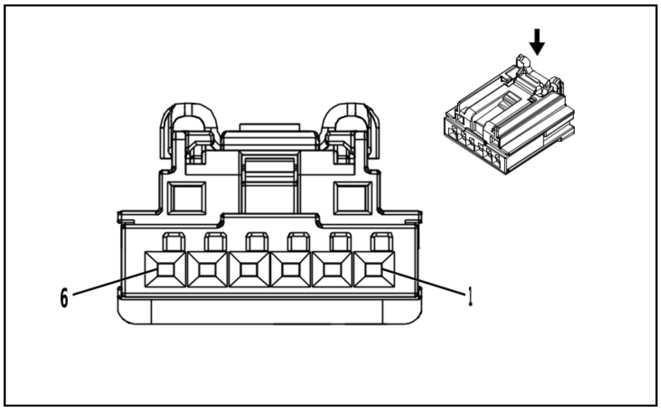
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required
III	Not required	J-35616-64B (L-BU)	No Tool Required

S79D Front Side Door Window Control Switch - Driver X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5 (1) 0.5	(1) BN (1) WH / BN	(1) 10201 (1) 2764	(1) Left Front Mirror Motor Extend Control (1) Window Switch Left Front Down Signal	(1) II (1) II	(1) — (1) —
(2) 2	(2) 0.5	(2) GN	(2) 2766	(2) Power Window Switch Left Front Express Signal	(2) III	(2) —
(3) 3	(3) 0.5	(3) BN / YE	(3) 2771	(3) Left Front Door Lock Switch Lock Signal	(3) III	(3) —
(4) 4	(4) 0.5	(4) BN / WH	(4) 2772	(4) Left Front Door Lock Switch Unlock Signal	(4) III	(4) —
(5) 5	(5) 0.5	(5) GY / VT	(5) 2767	(5) LED Ambient Lighting Control Left Front Door	(5) III	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) BN / GY	(7) 4784	(7) Left Front Door LED Backlight Dimming Control	(7) III	(7) —
(8) 8	(8) 0.35	(8) GY / YE	(8) 1760	(8) Left Side Object Detection LED Control	(8) III	(8) —
(9) 9	(9) 0.5	(9) WH / GN	(9) 2786	(9) Left Front Mirror Motor Fold In Control	(9) III	(9) —
(10) 10	(10) 0.5	(10) YE / BN	(10) 2789	(10) Left Front Mirror Motor Common Control	(10) III	(10) —
(11) 11	(11) 0.5	(11) BK	(11) 1550	(11) Ground	(11) II	(11) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(12) 12	(12) 0.5	(12) GY / WH	(12) 2785	(12) Left Front Mirror Motor Fold Out Control	(12) I	(12) —
(13) 13	(13) 0.5	(13) WH / BN	(13) 2764	(13) Window Switch Left Front Down Signal	(13) III	(13) —
14 - 15	—	—	—	Not Occupied	—	—
(16) 16	(16) 0.5	(16) GY / GN	(16) 2763	(16) Window Switch Left Front Up Signal	(16) III	(16) —
(17) 17	(17) 0.5	(17) WH / VT	(17) 4258	(17) Left Front Door Lock Status Signal	(17) III	(17) —
(18) 18	(18) 0.5	(18) VT / BU	(18) 2788	(18) Left Front Mirror Motor Up [+] Down [-] Control	(18) III	(18) —
(19) 19	(19) 0.5	(19) BN / BK	(19) 2790	(19) Left Front Mirror Motor Right [+] Left [-] Control	(19) III	(19) —
20	—	—	—	Not Occupied	—	—
(21) 21	(21) 0.5	(21) GN / YE	(21) 6134	(21) Body Control Module LIN Bus 3	(21) III	(21) —
(22) 22	(22) 0.5	(22) WH	(22) 606	(22) Left Outside Rearview Mirror Heater Control	(22) I	(22) —
(23) 23	(23) 0.5 (23) 0.5	(23) WH / BK (23) GY / GN	(23) 10202 (23) 2763	(23) Left Front Mirror Motor Retract Control (23) Window Switch Left Front Up Signal	(23) II (23) II	(23) — (23) —
(24) 24	(24) 0.5	(24) RD / BU	(24) 1240	(24) Battery Positive Voltage	(24) II	(24) —

S79D Front Side Door Window Control Switch - Driver X2



4145138

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Left
- OEM Connector: 2035363-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

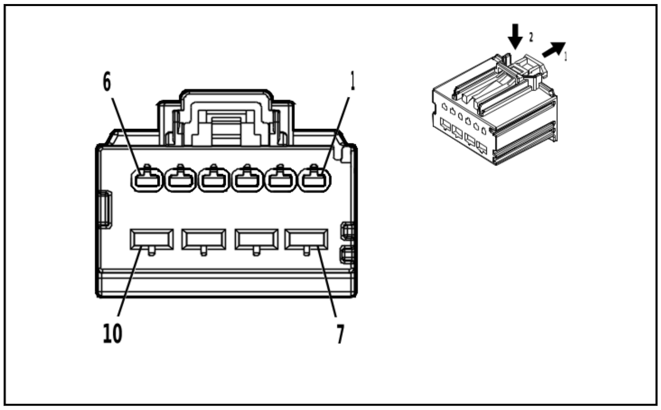
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S79D Front Side Door Window Control Switch - Driver X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / YE	(1) 2792	(1) Left Front Mirror Position Sensor Left [-] Right [+] Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY / BN	(2) 2787	(2) Left Front Mirror Position Sensor Up [+] Down [-] Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) VT / RD	(3) 2791	(3) Left Front Mirror Position Sensor High Reference	(3) I	(3) —
(4) 4	(4) 0.5	(4) BK / BN	(4) 673	(4) Left Outside Rearview Mirror Position Sensor Low Reference	(4) I	(4) —
5 - 6	—	—	—	Not Occupied	—	—

S79LR Rear Side Door Window Switch - Left



5035058

Connector Part Information

- Harness Type: Rear Side Door Door Wiring Harness - Left
- OEM Connector: 31372-1600
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 1.5, 2.8 MX Series(BK)

Terminal Part Information

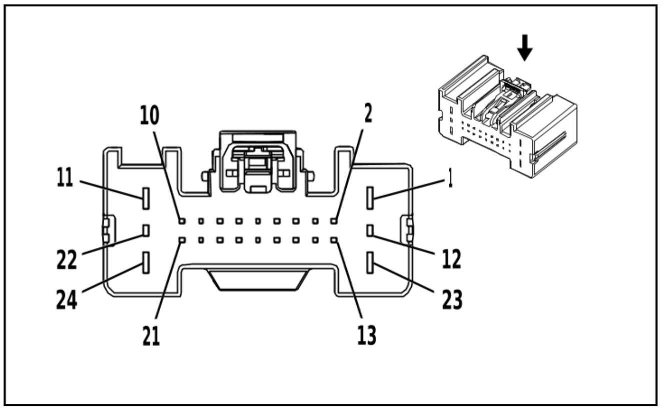
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

S79LR Rear Side Door Window Switch - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / GY	(1) 6135	(1) Body Control Module LIN Bus 4	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 747	(2) Left Rear Door Ajar Switch Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BK	(3) 1550	(3) Ground	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 2.5	(7) BK	(7) 1550	(7) Ground	(7) II	(7) —
(8) 8	(8) 2.5	(8) RD / BU	(8) 3240	(8) Battery Positive Voltage	(8) II	(8) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(9) 9	(9) 2	(9) BU / VT	(9) 668	(9) Left Rear Window Motor Up Control	(9) II	(9) —
(10) 10	(10) 2	(10) YE / BU	(10) 669	(10) Left Rear Window Motor Down Control	(10) II	(10) —

S79P Front Side Door Window Switch - Passenger X1



2871905

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Right
- OEM Connector: 7287-3260-30
- Service Connector: Service by Harness - See Part Catalog
- Description: 24-Way F 0.64 GEN-Y, 1.5, 2.8 YESC Series(BK)

Terminal Part Information

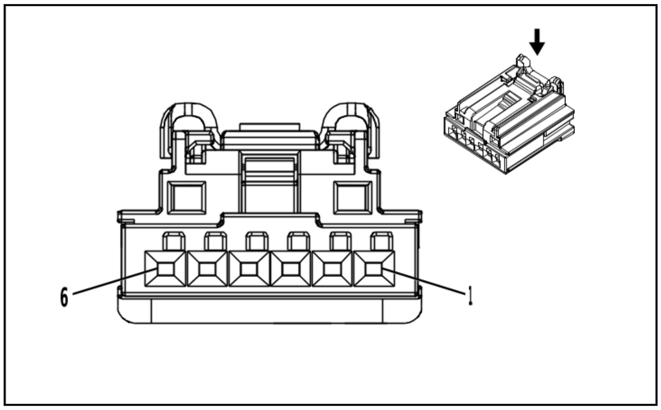
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required
III	Not required	J-35616-64B (L-BU)	No Tool Required

S79P Front Side Door Window Switch - Passenger X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) BK	(1) 1350	(1) Ground	(1) II	(1) —
(2) 2	(2) 0.5	(2) YE / RD	(2) 2799	(2) Right Front Mirror Position Sensor High Reference	(2) III	(2) —
(3) 3	(3) 0.5	(3) GN / BK	(3) 2798	(3) Right Front Mirror Motor Right [+] Left [-] Control	(3) III	(3) —
(4) 4	(4) 0.5	(4) YE / VT	(4) 2796	(4) Right Front Mirror Motor Up [+] Down [-] Control	(4) III	(4) —
(5) 5	(5) 0.5	(5) BN	(5) 5295	(5) Window Switch Right Front Down Signal	(5) III	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) GY / VT	(7) 4638	(7) LED Backlight Dimming Control Right Front Door	(7) III	(7) —
(8) 8	(8) 0.35	(8) GY	(8) 1761	(8) Right Side Object Detection LED Control	(8) III	(8) —
(9) 9	(9) 0.5	(9) BU / GY	(9) 2794	(9) Right Front Mirror Motor Fold In Control	(9) III	(9) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(10) 10	(10) 0.5	(10) YE / WH	(10) 2793	(10) Right Front Mirror Motor Fold Out Control	(10) III	(10) —
(11) 11	(11) 0.5 (11) 2.5	(11) VT (11) GN / GY	(11) 10204 (11) 666	(11) Right Front Mirror Motor Retract Control (11) Right Front Window Motor Up Control	(11) II (11) II	(11) — (11) —
(12) 12	(12) 0.5	(12) BN / VT	(12) 607	(12) Right Outside Rearview Mirror Heater Control	(12) I	(12) —
(13) 13	(13) 0.5	(13) GN	(13) 1184	(13) Window Switch Right Front Up Signal	(13) III	(13) —
(14) 14	(14) 0.5	(14) GN / YE	(14) 6134	(14) Body Control Module LIN Bus 3	(14) III	(14) —
(15) 15	(15) 0.5	(15) VT / WH	(15) 2800	(15) Right Front Mirror Position Sensor Left [-] Right [+] Signal	(15) III	(15) —
(16) 16	(16) 0.5	(16) BU / YE	(16) 2795	(16) Right Front Mirror Position Sensor Up [+] Down [-] Signal	(16) III	(16) —
(17) 17	(17) 0.5	(17) YE / VT	(17) 2773	(17) Right Front Door Lock Switch Lock Control	(17) III	(17) —
(18) 18	(18) 0.5	(18) BN / VT	(18) 2774	(18) Right Front Door Lock Switch Unlock Control	(18) III	(18) —
19	—	—	—	Not Occupied	—	—
(20) 20	(20) 0.5 (20) 0.5	(20) VT / GY (20) GY	(20) 2765 (20) 746	(20) Window Switch Right Front Express Signal (20) Right Front Door Ajar Switch Signal	(20) III (20) III	(20) — (20) —
(21) 21	(21) 0.5	(21) WH	(21) 2797	(21) Right Front Mirror Motor Common Control	(21) III	(21) —
(22) 22	(22) 0.5	(22) BK / GN	(22) 675	(22) Right Outside Rearview Mirror Position Sensor Low Reference	(22) I	(22) —
(23) 23	(23) 2.5	(23) RD / BN	(23) 4240	(23) Battery Positive Voltage	(23) II	(23) —
(24) 24	(24) 0.5 (24) 2.5	(24) BN / GN (24) YE / BU	(24) 10203 (24) 667	(24) Right Front Mirror Motor Extend Control (24) Right Front Window Motor Down Control	(24) II (24) II	(24) — (24) —

S79P Front Side Door Window Switch - Passenger X2



4145138

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Right
- OEM Connector: 2035363-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

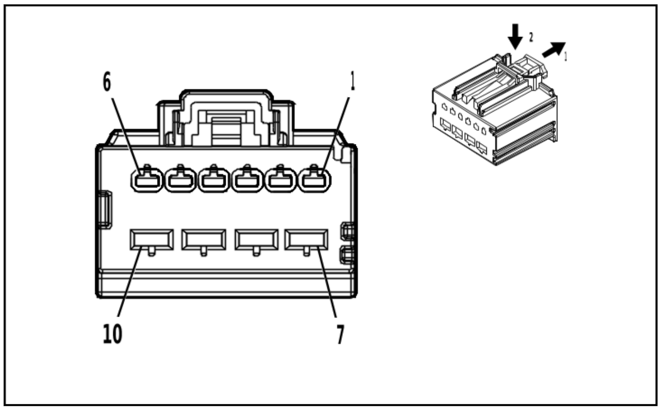
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S79P Front Side Door Window Switch - Passenger X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.5	(2) WH / BN	(2) 2768	(2) LED Ambient Lighting Control Right Front Door	(2) I	(2) —
3 - 6	—	—	—	Not Occupied	—	—

S79RR Rear Side Door Window Switch - Right



5035058

Connector Part Information
- Harness Type: Rear Side Door Door Wiring Harness - Right
- OEM Connector: 31372-1600
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 1.5, 2.8 MX Series(BK)

Terminal Part Information

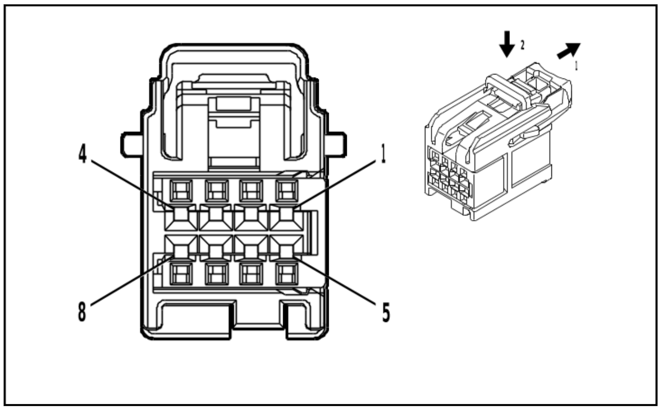
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

S79RR Rear Side Door Window Switch - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / GY	(1) 6135	(1) Body Control Module LIN Bus 4	(1) I	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 748	(2) Right Rear Door Ajar Switch Signal	(2) I	(2) —
3 - 6	—	—	—	Not Occupied	—	—
(7) 7	(7) 2.5	(7) BK	(7) 1350	(7) Ground	(7) II	(7) —
(8) 8	(8) 2.5	(8) YE / BK	(8) 4840	(8) Battery Positive Voltage	(8) II	(8) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(9) 9	(9) 2	(9) BU / GY	(9) 670	(9) Right Rear Window Motor Up Control	(9) II	(9) —
(10) 10	(10) 2	(10) GN / BK	(10) 671	(10) Right Rear Window Motor Down Control	(10) II	(10) —

S86 Vehicle Stability Control System Switch



4935776

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 15526972
- Service Connector: 19370429
- Description: 8-Way F 0.64 OCS Series(BK)

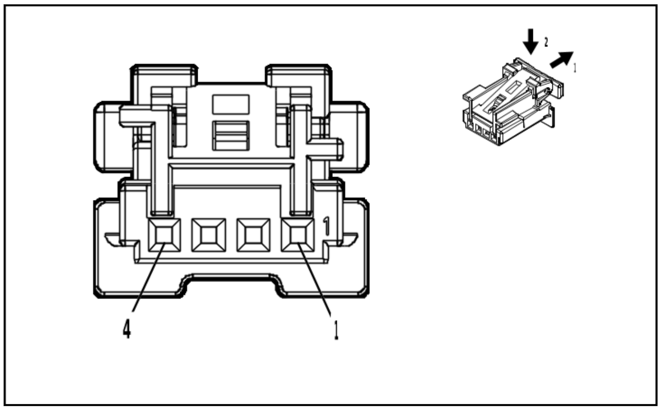
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S86 Vehicle Stability Control System Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BU / VT	(1) 1788	(1) Traction Control Switch Signal 1	(1) I	(1) —
(2) 2	(2) 0.35	(2) YE	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) BN	(3) 7291	(3) Major Endgate Release Switch Signal Interior	(3) I	(3) —
(4) 4	(4) 0.35	(4) BU / YE	(4) 6844	(4) ABS/Traction Control Hill Descent Control Switch Signal	(4) I	(4) —
5	—	—	—	Not Occupied	—	—
(6) 6	(6) 0.35	(6) BK / WH	(6) 851	(6) Signal Ground	(6) I	(6) —
(7) 7	(7) 0.35	(7) GN / WH	(7) 111	(7) Hazard Warning Switch Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) GY	(8) 1198	(8) Endgate Release Switch Analog Signal Interior	(8) I	(8) —

S91 Parking Brake Control Switch



4997407

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 2294218-1
- Service Connector: 19371192
- Description: 4-Way F 0.64 Micro-Quadlock Series(BK)

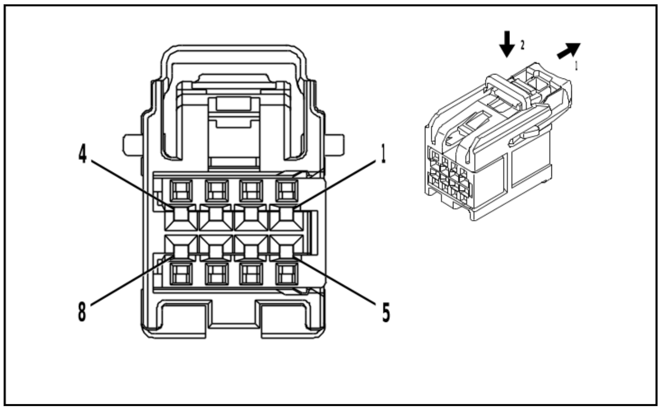
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S91 Parking Brake Control Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) RD / YE	(1) 4340	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / YE	(2) 2731	(2) Brake System Control Module LIN Bus 1	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.35	(4) BK / WH	(4) 851	(4) Signal Ground	(4) I	(4) —

S126 Ride Control Switch



4232228

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 15526973
- Service Connector: 19353873
- Description: 8-Way F 0.64 OCS Series(GY)

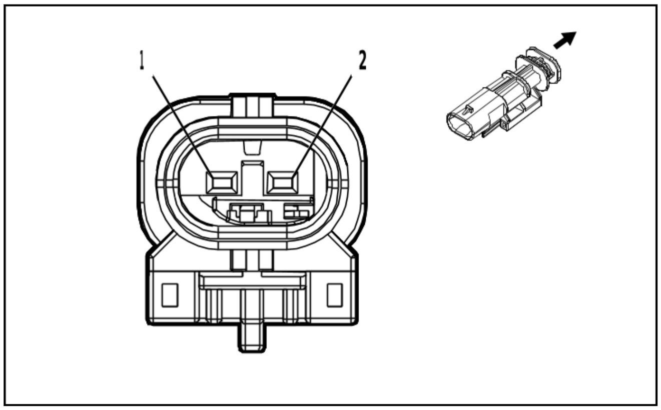
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S126 Ride Control Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) WH / BN	(1) 2203	(1) Enhanced Driver Mode 2 Switch Signal	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.35	(3) BK / GY	(3) 2204	(3) Enhanced Driver Mode 1 Switch Low Reference	(3) I	(3) —
(4) 4	(4) 0.35	(4) YE	(4) 6817	(4) LED Backlight Dimming Control 1	(4) I	(4) —
(5) 5	(5) 0.35	(5) BK / WH	(5) 851	(5) Signal Ground	(5) I	(5) —
6 - 8	—	—	—	Not Occupied	—	—

S158 Liftgate Exterior Release Switch - Auxiliary Endgate



4994410

Connector Part Information

- Harness Type: Endgate Wiring Harness
- OEM Connector: 34899-2081
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 MCON Series, Sealed(GY)

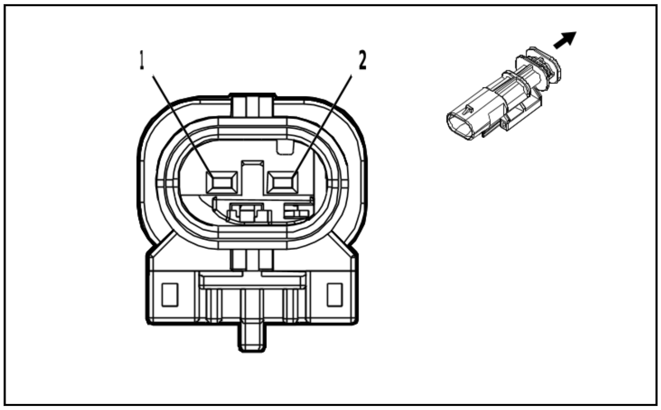
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

S158 Liftgate Exterior Release Switch - Auxiliary Endgate

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) YE	(1) 7294	(1) Minor Endgate Release Switch Discrete Signal Exterior	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

S159E Liftgate Exterior Release Switch - Endgate



4994411

Connector Part Information

- Harness Type: Endgate Wiring Harness
- OEM Connector: 34899-2082
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 MCON Series, Sealed(GY)

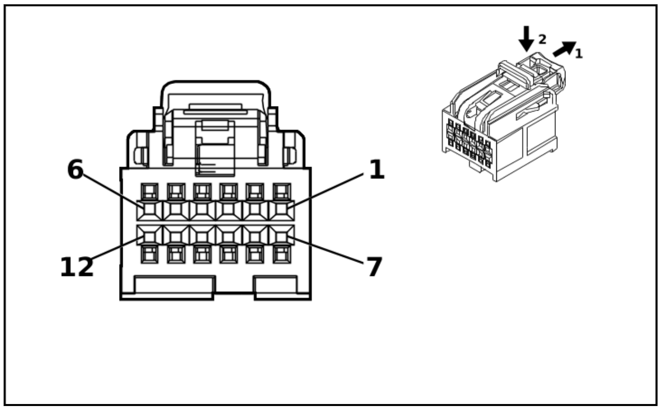
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-17 (L-GN)	No Tool Required

S159E Liftgate Exterior Release Switch - Endgate

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5 (1) 0.5	(1) GY (1) YE	(1) 7292 (1) 1144	(1) Major Endgate Release Switch Signal Exterior (1) Endgate Release Switch Discrete Signal Exterior	(1) I (1) I	(1) QT5 (1) QT6
(2) 2	(2) 0.5	(2) BK	(2) 1850	(2) Ground	(2) I	(2) —

S171L Instrument Panel Center Accessory Function Switch - Left



4975223

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35016616
- Service Connector: 13519750
- Description: 12-Way F 0.64 OCS Series(BK)

Terminal Part Information

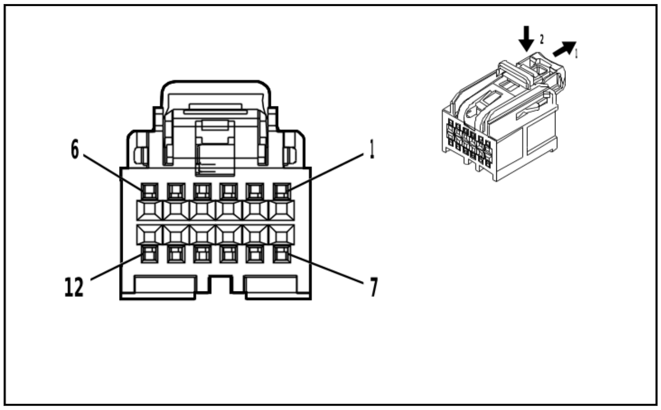
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19354230	J-35616-64B (L-BU)	J-38125-215A

S171L Instrument Panel Center Accessory Function Switch - Left

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GY / GN	(1) 2555	(1) Rear Parking Assist Disable Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) YE	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) BU / WH	(3) 3119	(3) Roof Rail Air Bag Disable Switch Signal	(3) I	(3) —
(4) 4	(4) 0.35	(4) GY / WH	(4) 3153	(4) Lane Departure Warning Disable Switch Signal	(4) I	(4) —
(5) 5	(5) 0.35	(5) WH	(5) 3152	(5) Lane Departure Warning Indicator Control	(5) I	(5) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(6) 6	(6) 0.35	(6) BU / YE	(6) 6844	(6) ABS/Traction Control Hill Descent Control Switch Signal	(6) I	(6) —
7	—	—	—	Not Occupied	—	—
(8) 8	(8) 0.35	(8) GN / BN	(8) 5852	(8) Rear Parking Assist Disable LED Signal	(8) I	(8) —
(9) 9	(9) 0.35	(9) BK / WH	(9) 851	(9) Signal Ground	(9) I	(9) —
(10) 10	(10) 0.35	(10) BN / WH	(10) 3895	(10) Roof Rail Air Bag Disable Switch Low Reference	(10) I	(10) —
(11) 11	(11) 0.35	(11) YE / BU	(11) 2912	(11) Driver Mode 2 Indicator Control	(11) I	(11) —
(12) 12	(12) 0.35	(12) GY	(12) 4989	(12) Driver Mode 2 Switch Signal	(12) I	(12) —

S171R Instrument Panel Center Accessory Function Switch - Right



4997362

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35016613
- Service Connector: 13519752
- Description: 12-Way F 0.64 OCS Series(BN)

Terminal Part Information

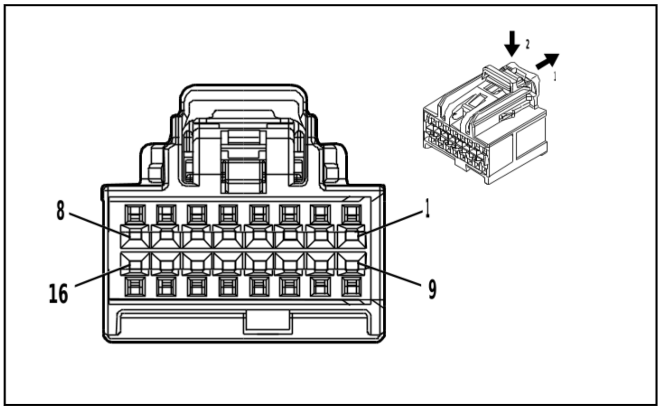
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19300660	J-35616-64B (L-BU)	J-38125-215A

S171R Instrument Panel Center Accessory Function Switch - Right

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.35	(2) YE	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) BU / YE	(3) 6844	(3) ABS/Traction Control Hill Descent Control Switch Signal	(3) I	(3) —
(4) 4	(4) 0.35 (4) 0.35	(4) YE / GN (4) VT / BK	(4) 7122 (4) 339	(4) Axle Differential Lock Switch Signal (4) Run/Crank Ignition 1 Voltage	(4) I (4) I	(4) G94 (4) PTO

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(5) 5	(5) 0.35 (5) 0.35	(5) YE (5) BN / GN	(5) 7115 (5) 4311	(5) Rear Axle Differential Lock Indicator Control (5) Power Take-Off Enable Cabin Switch Normally Closed Signal	(5) I (5) I	(5) G94 (5) PTO
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.35	(7) GN / WH	(7) 488	(7) Power Take-Off Control Switch Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) BU / YE	(8) 7176	(8) All Windows Open Switch Signal	(8) I	(8) —
(9) 9	(9) 0.35	(9) BK / WH	(9) 851	(9) Signal Ground	(9) I	(9) —
(10) 10	(10) 0.35	(10) WH	(10) 6816	(10) Indicator Dimming Control	(10) I	(10) —
11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.35	(12) BU / GY	(12) 4990	(12) Driver Mode 1 Switch Signal	(12) I	(12) —

S172 Auxiliary Multifunction Switch



4873243

Connector Part Information
- Harness Type: Auxiliary Fuse Block Wiring Harness
- OEM Connector: 35016343
- Service Connector: Service by Harness - See Part Catalog
- Description: 16-Way F 0.64 OCS Series(BK)

Terminal Part Information

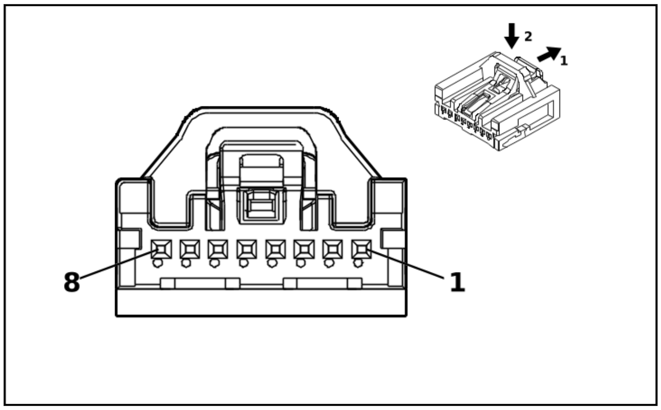
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

S172 Auxiliary Multifunction Switch

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.35	(2) YE	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) WH	(3) 6816	(3) Indicator Dimming Control	(3) I	(3) —
4 - 5	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(6) 6	(6) 0.35	(6) BU / WH	(6) 10716	(6) Upfitter Accessory Relay 1 Coil Control	(6) I	(6) —
(7) 7	(7) 0.35	(7) VT / GY	(7) 10717	(7) Upfitter Accessory Relay 2 Coil Control	(7) I	(7) —
(8) 8	(8) 0.35	(8) GN / BN	(8) 10718	(8) Upfitter Accessory Relay 3 Coil Control	(8) I	(8) —
(9) 9	(9) 0.35	(9) WH / YE	(9) 10719	(9) Upfitter Accessory Relay 4 Coil Control	(9) I	(9) —
(10) 10	(10) 0.35	(10) GY / VT	(10) 10720	(10) Upfitter Accessory Relay 5 Coil Control	(10) I	(10) —
11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.75	(12) BK	(12) 1050	(12) Ground	(12) I	(12) —
13 - 16	—	—	—	Not Occupied	—	—

S192 Radio Function Switch (IOR)



5200269

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35068228
- Service Connector: 84769201
- Description: 8-Way F Mini 50 Series(BK)

Terminal Part Information

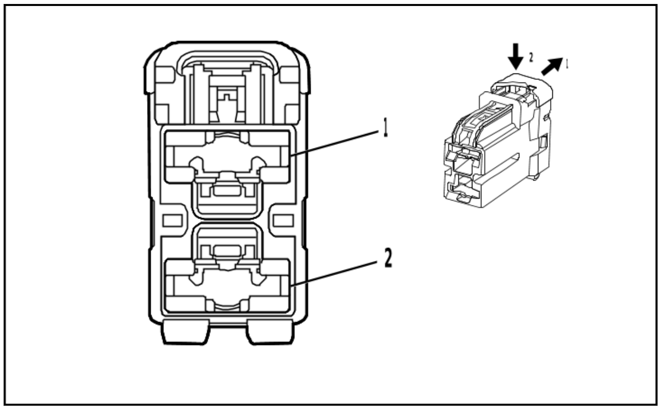
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

S192 Radio Function Switch (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) YE / RD	(1) 11236	(1) Radio Switch 5 Volt Reference	(1) I	(1) —
(2) 2	(2) 0.35	(2) BK / BU	(2) 11237	(2) Radio Switch Low Reference 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) BN / WH	(3) 11233	(3) Radio Switch Power ON/OFF Switch Signal	(3) I	(3) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(4) 4	(4) 0.35	(4) BK / GN	(4) 11238	(4) Radio Switch Low Reference 2	(4) I	(4) —
(5) 5	(5) 0.35	(5) BU / GY	(5) 11244	(5) Radio Switch Dimming Control	(5) I	(5) —
(6) 6	(6) 0.35	(6) VT / WH	(6) 11245	(6) Radio Switch Buttons Signal	(6) I	(6) —
(7) 7	(7) 0.35	(7) BU	(7) 11235	(7) Radio Switch Volume Up Signal	(7) I	(7) —
(8) 8	(8) 0.35	(8) GY / BN	(8) 11234	(8) Radio Switch Volume Down Signal	(8) I	(8) —

T1 DC/AC Converter Control Module X1



2453116

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 7283-0724-30
- Service Connector: 85011842
- Description: 2-Way F 9.5 Series(BK)

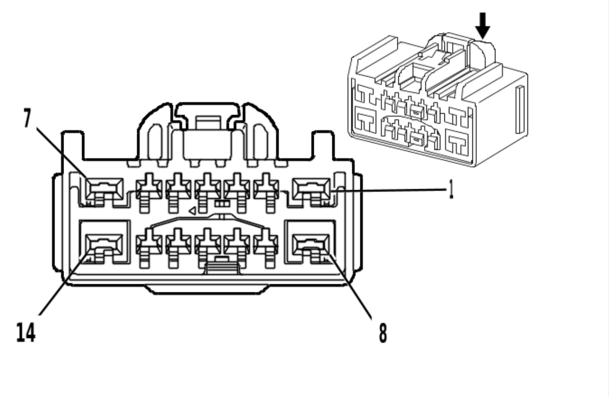
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-22 (RD)	No Tool Required

T1 DC/AC Converter Control Module X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 5	(1) BN / BK	(1) 4629	(1) DC/AC Inverter Control	(1) I	(1) —
(2) 2	(2) 5	(2) BK	(2) 1550	(2) Ground	(2) I	(2) —

T1 DC/AC Converter Control Module X2



1540775

Connector Part Information
- Harness Type: Body Rear Wiring Harness Extension Harness
- OEM Connector: 7289-7631-90
- Service Connector: Service by Harness - See Part Catalog
- Description: 14-Way F 1.5, 2.8 YESC Series(BU)

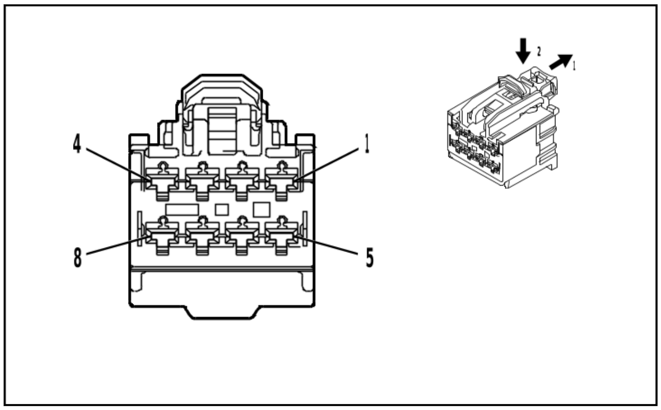
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

T1 DC/AC Converter Control Module X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) AC Outlet Phase A Control	(1) II	(1) —
(2) 2	(2) 0.5	(2) VT / RD	(2) 4049	(2) AC Power Outlet Sensor High Reference	(2) I	(2) —
(3) 3	(3) 0.35	(3) VT / WH	(3) 239	(3) Run/Crank Ignition 1 Voltage	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH / GN	(4) 4628	(4) DC/AC Inverter Relay Control	(4) I	(4) —
(5) 5	(5) 0.5	(5) BU / BN	(5) 6807	(5) DC/AC Inverter Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.75	(7) BK / WH	(7) 10120	(7) AC Outlet 2 Phase A Control	(7) II	(7) —
(8) 8	(8) 0.75	(8) RD	(8) 10118	(8) AC Outlet Phase B Control	(8) II	(8) —
(9) 9	(9) 0.35	(9) BARE	(9) 10116	(9) AC Outlet Low Reference	(9) I	(9) —
(10) 10	(10) 0.5	(10) GN / BU	(10) 6133	(10) Body Control Module LIN Bus 2	(10) I	(10) —
11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.5	(12) GN / BN	(12) 2266	(12) DC/AC Inverter Control 2	(12) I	(12) —
(13) 13	(13) 0.35	(13) BARE	(13) 10119	(13) AC Outlet 2 Low Reference	(13) I	(13) —
(14) 14	(14) 0.75	(14) RD / WH	(14) 10121	(14) AC Outlet 2 Phase B Control	(14) II	(14) —

T3 Audio Amplifier X1



4875738

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 33223792
- Service Connector: 19369366
- Description: 8-Way F 2.8 OCS Series(BK)

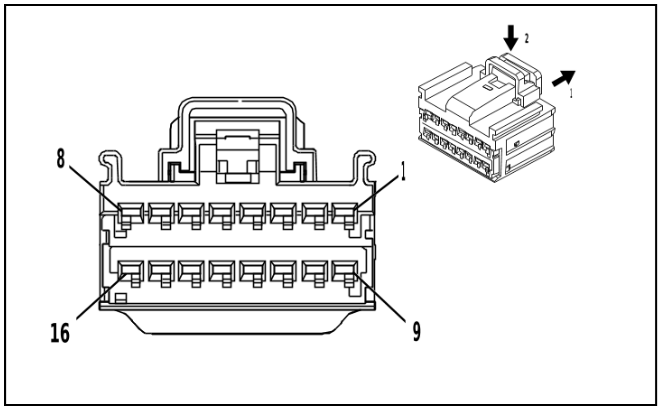
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required

T3 Audio Amplifier X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) BU / GY	(1) 346	(1) Left/Rear Subwoofer [+] Control	(1) I	(1) —
(2) 2	(2) 0.75	(2) YE	(2) 200	(2) Right Front Speaker 1 [+] Control	(2) I	(2) —
(3) 3	(3) 0.75	(3) BU	(3) 201	(3) Left Front Speaker 1 [+] Control	(3) I	(3) —
(4) 4	(4) 2.5	(4) RD / YE	(4) 3740	(4) Battery Positive Voltage	(4) I	(4) —
(5) 5	(5) 2.5	(5) GN / BK	(5) 1794	(5) Left/Rear Subwoofer [-] Control	(5) I	(5) —
(6) 6	(6) 0.75	(6) YE / BK	(6) 117	(6) Right Front Speaker [-] Control 1	(6) I	(6) —
(7) 7	(7) 0.75	(7) BN / BU	(7) 118	(7) Left Front Speaker [-] Control 1	(7) I	(7) —
(8) 8	(8) 2.5	(8) BK / WH	(8) 1051	(8) Signal Ground	(8) I	(8) —

T3 Audio Amplifier X2



4332214

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 15512506
- Service Connector: 13591061
- Description: 16-Way F 1.5 OCS Series(BK)

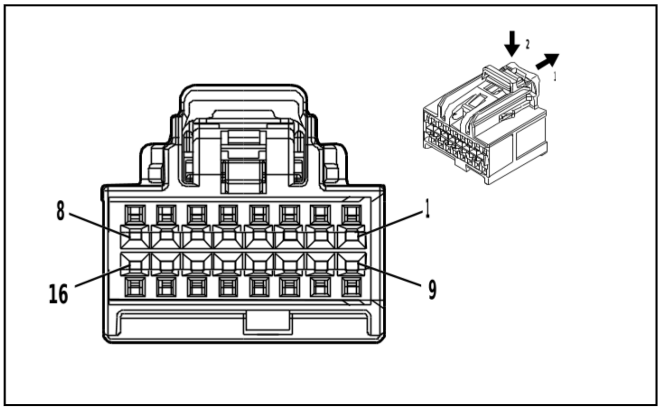
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84757974	J-35616-2A (GY)	J-38125-215A

T3 Audio Amplifier X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.75	(2) BN / BK	(2) 1953	(2) Right Front Midrange Speaker [-] Control	(2) I	(2) —
(3) 3	(3) 0.75	(3) BU / VT	(3) 1857	(3) Left Front Midrange Speaker [+] Control	(3) I	(3) —
(4) 4	(4) 1.5	(4) WH	(4) 46	(4) Right Rear Speaker [+] Control	(4) I	(4) —
(5) 5	(5) 1.5	(5) GN	(5) 199	(5) Left Rear Speaker [+] Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.75	(7) YE / WH	(7) 1860	(7) Front Center Speaker [+] Control	(7) I	(7) —
8 - 9	—	—	—	Not Occupied	—	—
(10) 10	(10) 0.75	(10) WH / YE	(10) 1853	(10) Right Front Midrange Speaker [+] Control	(10) I	(10) —
(11) 11	(11) 0.75	(11) BU / BN	(11) 1957	(11) Left Front Midrange Speaker [-] Control	(11) I	(11) —
(12) 12	(12) 1.5	(12) BU / BK	(12) 115	(12) Right Rear Speaker [-] Control	(12) I	(12) —
(13) 13	(13) 1.5	(13) GN / BK	(13) 116	(13) Left Rear Speaker [-] Control	(13) I	(13) —
14	—	—	—	Not Occupied	—	—
(15) 15	(15) 0.75	(15) BU / YE	(15) 1960	(15) Front Center Speaker [-] Control	(15) I	(15) —
16	—	—	—	Not Occupied	—	—

T3 Audio Amplifier X3



4873243

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35016343
- Service Connector: 13519738
- Description: 16-Way F 0.64 OCS Series(BK)

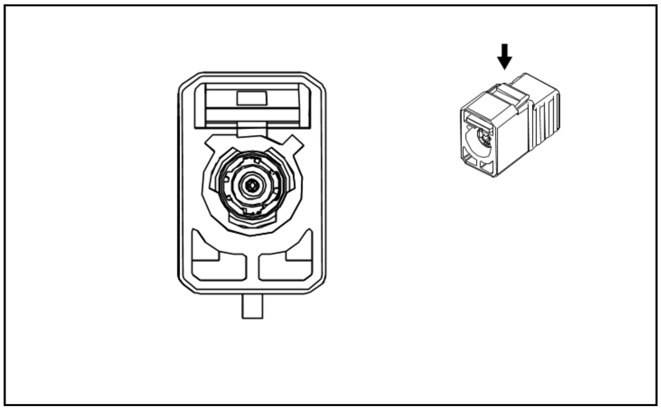
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84619127	J-35616-64B (L-BU)	J-38125-215A
II	Service by Cable	J-35616-64B (L-BU)	EL-38215-215A

T3 Audio Amplifier X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) YE	(1) 7215	(1) Ethernet Bus 6 [+]	(1) II	(1) —
(2) 2	(2) 0.35	(2) GN	(2) 7214	(2) Ethernet Bus 6 [-]	(2) II	(2) —
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.35	(5) GN / BN	(5) 3005	(5) Active Noise Cancellation Microphone 1 Signal	(5) I	(5) —
6 - 10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.5	(11) BU / WH	(11) 4985	(11) AUTOSAR CAN Bus [+] 5 Serial Data	(11) I	(11) —
(12) 12	(12) 0.5	(12) BU / YE	(12) 4984	(12) AUTOSAR CAN Bus [-] 5 Serial Data	(12) I	(12) —
(13) 13	(13) 0.35	(13) GN / BK	(13) 3008	(13) Active Noise Cancellation Microphone 1 Feedback Signal	(13) I	(13) —
14 - 16	—	—	—	Not Occupied	—	—

T4M Radio Antenna



2893647

Connector Part Information

- Harness Type: Radio Antenna Cable Extension Cable COAX
- OEM Connector: 3FA1-NASJ-C01W6
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

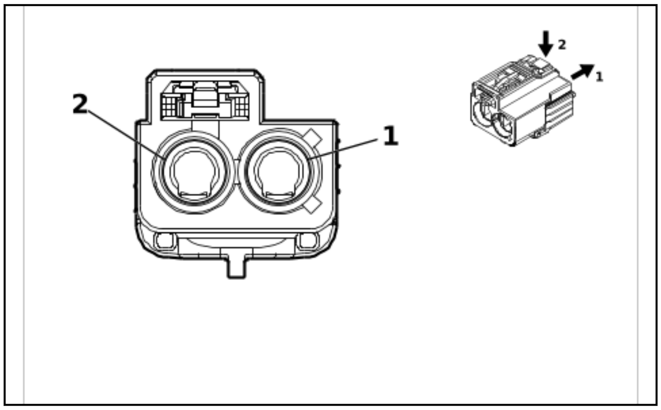
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

T4M Radio Antenna

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(AM/FM) Antenna RF Signal	I	—

T4P High Frequency Antenna X1



5661671

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33351060
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 2-Way F Coax Type(VT)

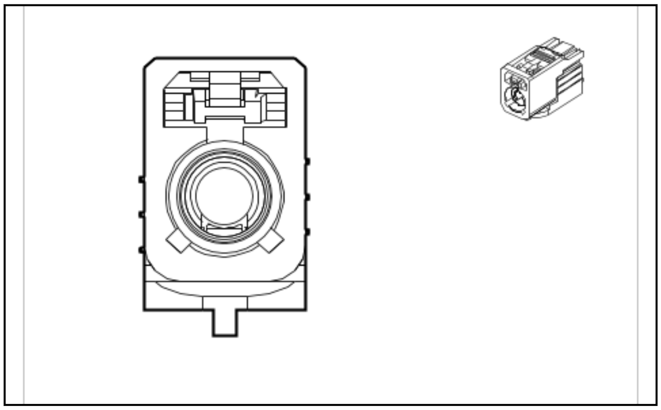
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

T4P High Frequency Antenna X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(GPS/Cell) Coaxial Antenna Cell/GPS combined Signal	I	—

T4P High Frequency Antenna X2



5661657

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33351022
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(YE)

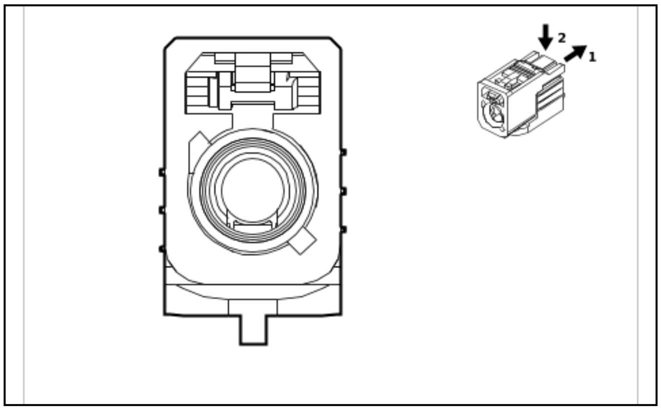
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

T4P High Frequency Antenna X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	(XM +/-HD) Coaxial Antenna XM Signal	I	—

T4TA Auxiliary Wireless Communication Interface Antenna



5518436

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33351021
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BG)

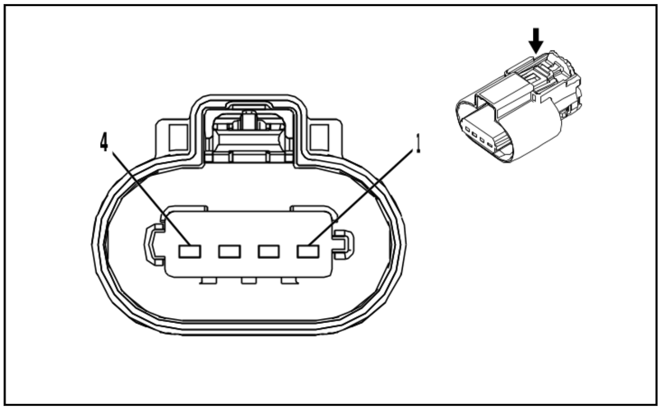
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

T4TA Auxiliary Wireless Communication Interface Antenna

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	WiFi Antenna Coaxial Signal	I	—

T8A Ignition Coil 1



3240115

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 34770-0402
- Service Connector: 19367596
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

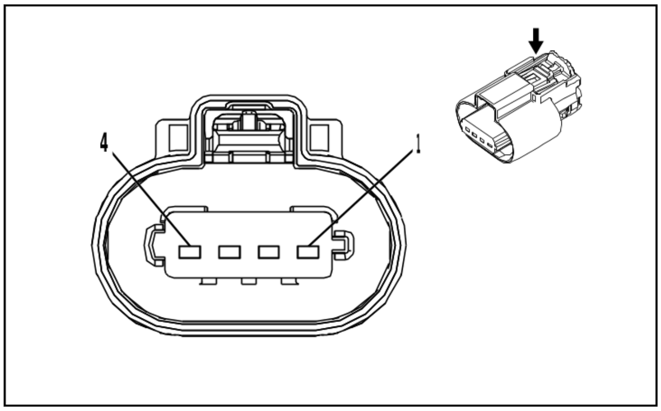
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

T8A Ignition Coil 1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 6150	(1) Engine Odd Bank Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / BU	(2) 2129	(2) Ignition Control Low Reference Bank 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / VT	(3) 2121	(3) Ignition Control 1	(3) I	(3) —
(4) 4	(4) 0.75	(4) VT / BU	(4) 5291	(4) Powertrain Main Relay Fused Supply Voltage 2	(4) I	(4) —

T8B Ignition Coil 2



3240115

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 34770-0402
- Service Connector: 19367596
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

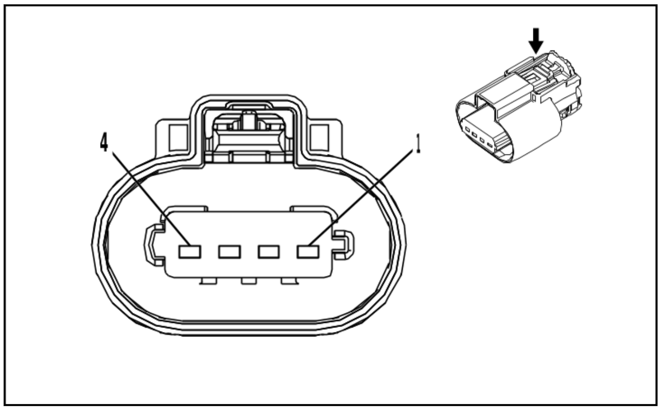
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

T8B Ignition Coil 2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 6450	(1) Engine Even Bank Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 2130	(2) Ignition Control Low Reference Bank 2	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / WH	(3) 2122	(3) Ignition Control 2	(3) I	(3) —
(4) 4	(4) 0.75	(4) VT / BU	(4) 5292	(4) Powertrain Main Relay Fused Supply Voltage 3	(4) I	(4) —

T8C Ignition Coil 3



3240115

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 34770-0402
- Service Connector: 19367596
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

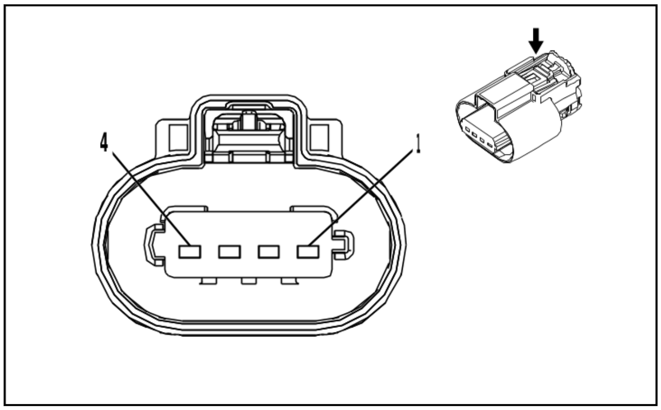
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

T8C Ignition Coil 3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 6150	(1) Engine Odd Bank Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / BU	(2) 2129	(2) Ignition Control Low Reference Bank 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN / BU	(3) 2123	(3) Ignition Control 3	(3) I	(3) —
(4) 4	(4) 0.75	(4) VT / BU	(4) 5291	(4) Powertrain Main Relay Fused Supply Voltage 2	(4) I	(4) —

T8D Ignition Coil 4



3240115

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 34770-0402
- Service Connector: 19367596
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

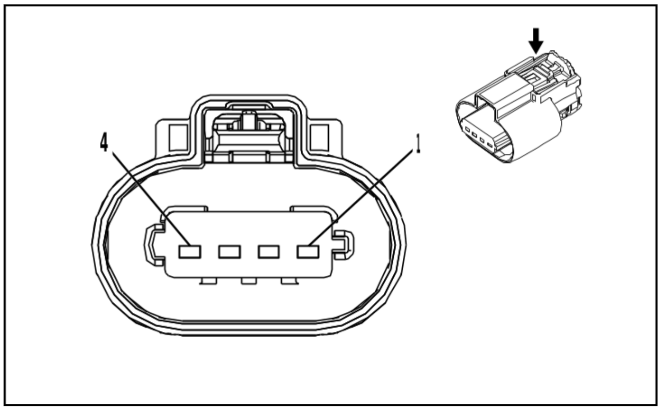
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

T8D Ignition Coil 4

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 6450	(1) Engine Even Bank Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 2130	(2) Ignition Control Low Reference Bank 2	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / BU	(3) 2124	(3) Ignition Control 4	(3) I	(3) —
(4) 4	(4) 0.75	(4) VT / BU	(4) 5292	(4) Powertrain Main Relay Fused Supply Voltage 3	(4) I	(4) —

T8E Ignition Coil 5



3240115

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 34770-0402
- Service Connector: 19367596
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

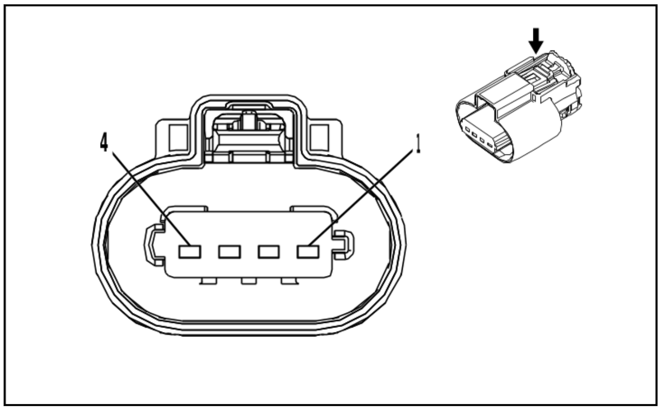
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

T8E Ignition Coil 5

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 6150	(1) Engine Odd Bank Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / BU	(2) 2129	(2) Ignition Control Low Reference Bank 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / GY	(3) 2125	(3) Ignition Control 5	(3) I	(3) —
(4) 4	(4) 0.75	(4) VT / BU	(4) 5291	(4) Powertrain Main Relay Fused Supply Voltage 2	(4) I	(4) —

T8F Ignition Coil 6



3240115

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 34770-0402
- Service Connector: 19367596
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

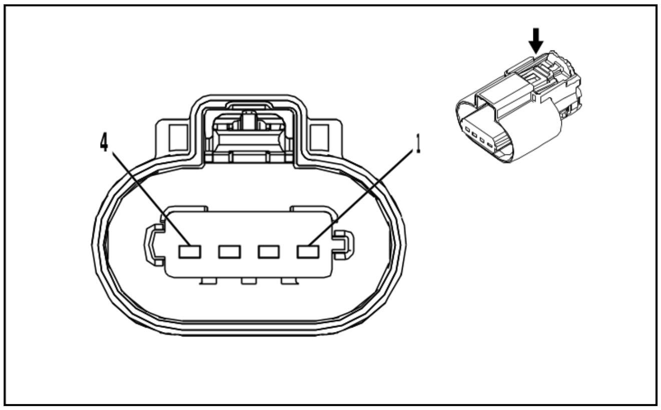
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

T8F Ignition Coil 6

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 6450	(1) Engine Even Bank Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 2130	(2) Ignition Control Low Reference Bank 2	(2) I	(2) —
(3) 3	(3) 0.5	(3) BN / BU	(3) 2126	(3) Ignition Control 6	(3) I	(3) —
(4) 4	(4) 0.75	(4) VT / BU	(4) 5292	(4) Powertrain Main Relay Fused Supply Voltage 3	(4) I	(4) —

T8G Ignition Coil 7



3240115

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 34770-0402
- Service Connector: 19367596
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

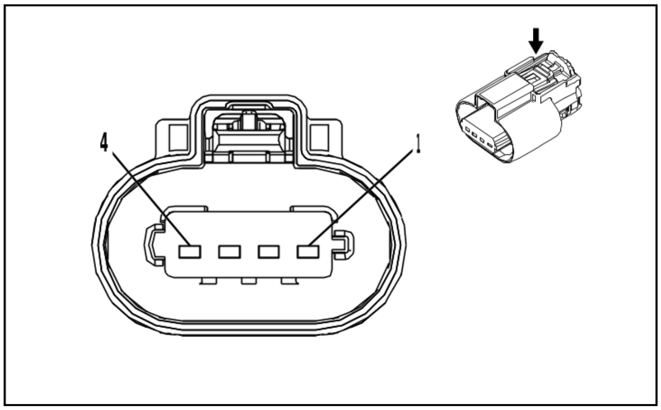
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

T8G Ignition Coil 7

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 6150	(1) Engine Odd Bank Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / BU	(2) 2129	(2) Ignition Control Low Reference Bank 1	(2) I	(2) —
(3) 3	(3) 0.5	(3) GN / GY	(3) 2127	(3) Ignition Control 7	(3) I	(3) —
(4) 4	(4) 0.75	(4) VT / BU	(4) 5291	(4) Powertrain Main Relay Fused Supply Voltage 2	(4) I	(4) —

T8H Ignition Coil 8



3240115

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 34770-0402
- Service Connector: 19367596
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

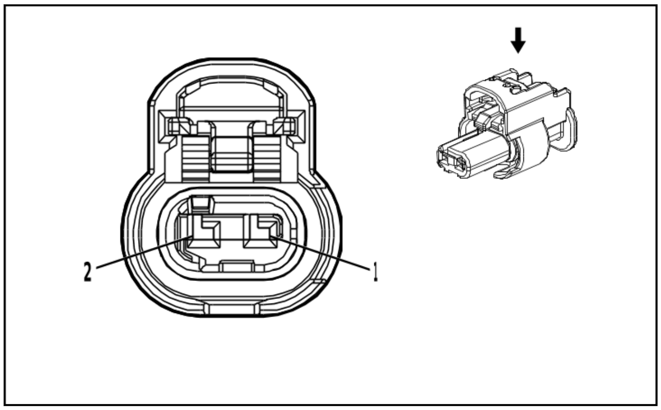
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required

T8H Ignition Coil 8

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 6450	(1) Engine Even Bank Ground	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK / GY	(2) 2130	(2) Ignition Control Low Reference Bank 2	(2) I	(2) —
(3) 3	(3) 0.5	(3) VT / WH	(3) 2128	(3) Ignition Control 8	(3) I	(3) —
(4) 4	(4) 0.75	(4) VT / BU	(4) 5292	(4) Powertrain Main Relay Fused Supply Voltage 3	(4) I	(4) —

T10G Low Frequency Rear Bumper Antenna



4690744

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 1-2296694-3
- Service Connector: 19366871
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

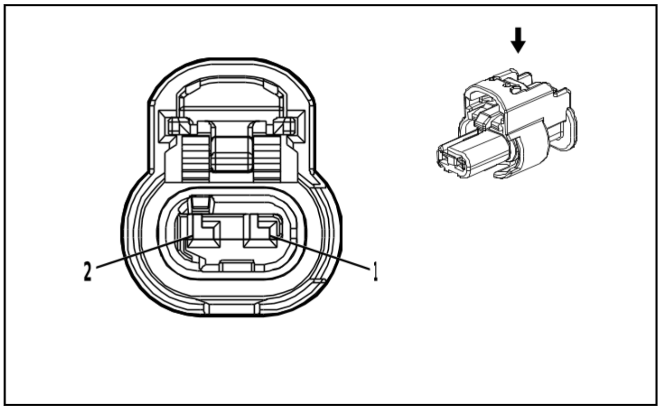
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

T10G Low Frequency Rear Bumper Antenna

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / GN	(1) 3568	(1) Rear Closure Passive Entry Antenna High Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / GY	(2) 3569	(2) Rear Closure Passive Entry Antenna Low Signal	(2) I	(2) —

T10J Low Frequency Instrument Panel Antenna



4690744

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 1-2296694-3
- Service Connector: 19366871
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

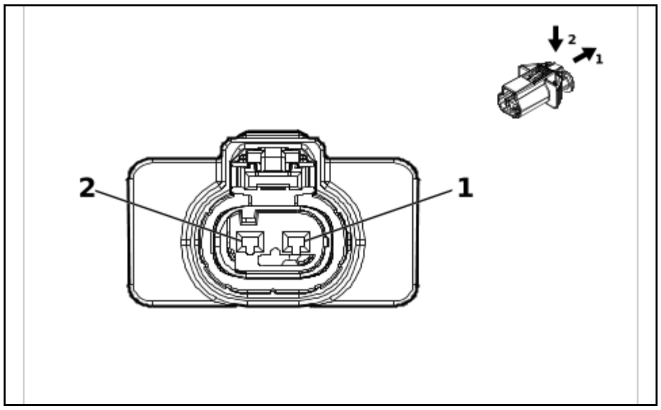
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

T10J Low Frequency Instrument Panel Antenna

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BN / BK	(1) 3552	(1) Interior Passive Entry Antenna 1 High Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) WH	(2) 3553	(2) Interior Passive Entry Antenna 1 Low Signal	(2) I	(2) —

T10KA Low Frequency Console Number 2 Antenna



6757461

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 35747315
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MLK Series, Sealed(BK)

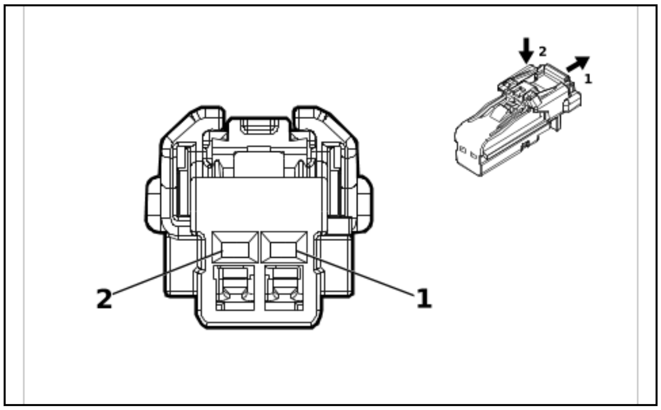
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

T10KA Low Frequency Console Number 2 Antenna

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BN / BK	(1) 3552	(1) Interior Passive Entry Antenna 1 High Signal	(1) I	(1) —
(2) 2	(2) 0.35	(2) WH	(2) 3553	(2) Interior Passive Entry Antenna 1 Low Signal	(2) I	(2) —

T10UA Low Frequency Console Antenna (AZ3)



4115691

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Center
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

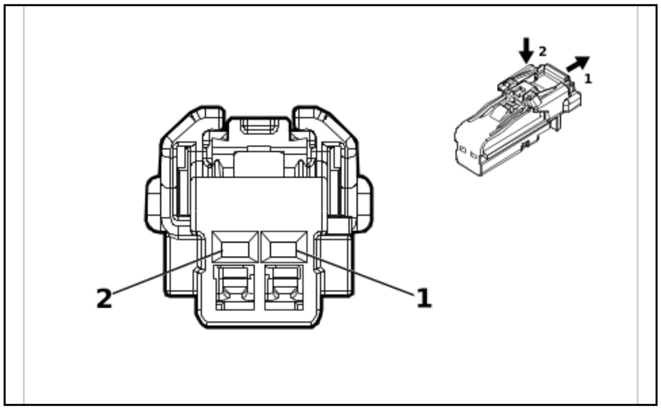
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

T10UA Low Frequency Console Antenna (AZ3)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / BK	(1) 4996	(1) Immobilizer Antenna Signal [+]	(1) I	(1) —
(2) 2	(2) 0.5	(2) WH / GY	(2) 4997	(2) Immobilizer Antenna Low Signal	(2) I	(2) —

T10UA Low Frequency Console Antenna (D07)



4115691

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series(BK)

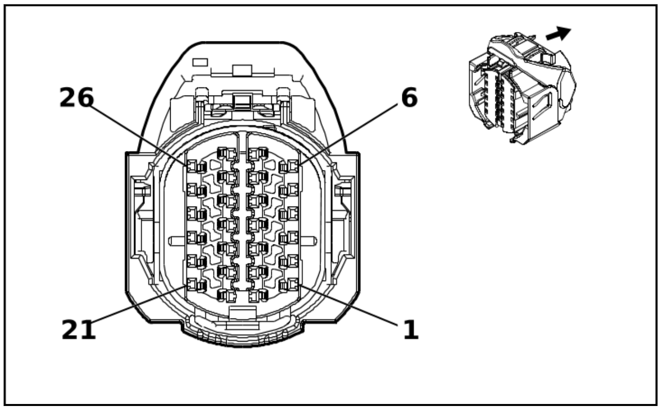
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

T10UA Low Frequency Console Antenna (D07)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BN / BK	(1) 4996	(1) Immobilizer Antenna Signal [+]	(1) I	(1) —
(2) 2	(2) 0.35	(2) WH / GY	(2) 4997	(2) Immobilizer Antenna Low Signal	(2) I	(2) —

T12 Automatic Transmission X1



5275597

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 2327375-1
- Service Connector: 13528029
- Description: 26-Way F 1.2 MCON Series, Sealed(BK)

Terminal Part Information

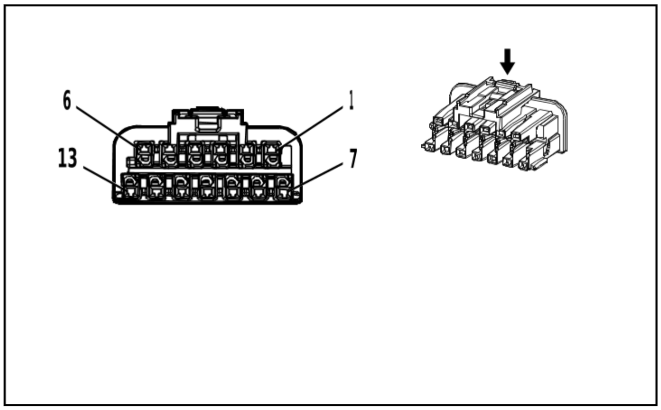
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19331733	J-35616-12 (BU)	J-38125-553

T12 Automatic Transmission X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / YE	(1) 6353	(1) Input Speed Signal	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / VT	(2) 4510	(2) Transmission Intermediate Speed Signal	(2) I	(2) —
(3) 3	(3) 0.5	(3) BN / WH	(3) 6254	(3) Transmission Input Speed Sensor Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) GY / BU	(4) 6358	(4) Output Speed Signal	(4) I	(4) —
(5) 5	(5) 0.5	(5) BU / WH	(5) 3338	(5) Transmission Internal Mode Switch Mode Control X	(5) I	(5) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(6) 6	(6) 0.5	(6) GN / YE	(6) 3337	(6) Transmission Internal Mode Switch Mode Control Y	(6) I	(6) —
(7) 7	(7) 0.5	(7) YE / GN	(7) 4170	(7) Transmission Output Shaft Speed Sensor Circuit 9V Reference	(7) I	(7) —
(8) 8	(8) 0.5	(8) YE / BU	(8) 4171	(8) Transmission Input Shaft Speed Sensor Circuit 9V Reference	(8) I	(8) —
(9) 9	(9) 0.5	(9) GY / BN	(9) 6388	(9) Transmission High Side Driver 2 Control	(9) I	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.5	(11) GN / GY	(11) 6387	(11) Transmission High Side Driver 1 Control	(11) I	(11) —
(12) 12	(12) 0.5	(12) WH / RD	(12) 480	(12) Engine Control Vehicle Sensors 5 Volt Reference 1	(12) I	(12) —
(13) 13	(13) 0.5	(13) BN / WH	(13) 585	(13) Transmission Fluid Temperature Sensor Signal	(13) I	(13) —
(14) 14	(14) 0.5	(14) YE / BN	(14) 6404	(14) Clutch Solenoid Valve E Control	(14) I	(14) —
(15) 15	(15) 0.5	(15) GY / GN	(15) 6403	(15) Clutch Solenoid Valve D Control	(15) I	(15) —
(16) 16	(16) 0.5	(16) GY	(16) 6402	(16) Clutch Solenoid Valve C Control	(16) I	(16) —
17 - 18	—	—	—	Not Occupied	—	—
(19) 19	(19) 0.5	(19) GN / BK	(19) 7819	(19) Default Disable Solenoid Control	(19) I	(19) —
(20) 20	(20) 0.5	(20) BK / GY	(20) 626	(20) Engine Control Vehicle Sensors Low Reference 1	(20) I	(20) —
(21) 21	(21) 0.5	(21) VT	(21) 4509	(21) Transmission Clutch F Control	(21) I	(21) —
(22) 22	(22) 0.5	(22) WH / BU	(22) 4507	(22) Transmission Clutch H Control	(22) I	(22) —
(23) 23	(23) 0.5	(23) WH	(23) 4508	(23) Transmission Clutch G Control	(23) I	(23) —
(24) 24	(24) 0.5	(24) GN / WH	(24) 1530	(24) Transmission Line Pressure Control Solenoid Valve Control	(24) I	(24) —
(25) 25	(25) 0.5	(25) VT / WH	(25) 422	(25) Torque Converter Clutch Solenoid Valve Control	(25) I	(25) —
(26) 26	(26) 0.5	(26) BK / BN	(26) 586	(26) Transmission Fluid Temperature Sensor Low Reference	(26) I	(26) —

T12 Automatic Transmission X2



4757907

Connector Part Information

- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2203990-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 13-Way F 1.2 MCON Series(BN)

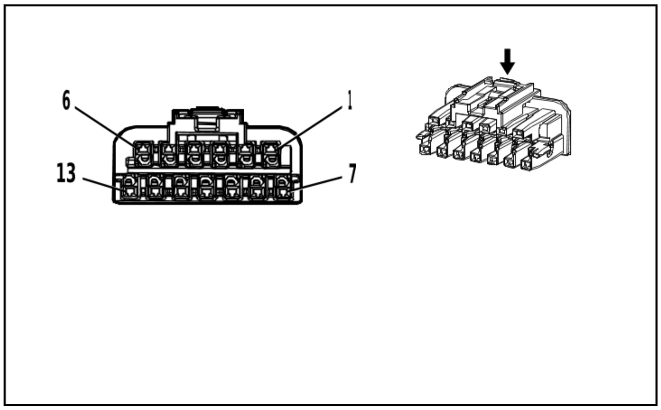
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

T12 Automatic Transmission X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	—	—	—	Not Occupied	—	—
(2) 2	(2) 0.5	(2) YE	(2) 3338	(2) Transmission Internal Mode Switch Mode Control X	(2) I	(2) —
(3) 3	(3) 0.5	(3) YE / OG	(3) 6358	(3) Output Speed Signal	(3) I	(3) —
(4) 4	(4) 0.5	(4) WH / BU	(4) 6254	(4) Transmission Input Speed Sensor Signal	(4) I	(4) —
(5) 5	(5) 0.5	(5) VT / GN	(5) 4510	(5) Transmission Intermediate Speed Signal	(5) I	(5) —
(6) 6	(6) 0.5	(6) WH / VT	(6) 6353	(6) Input Speed Signal	(6) I	(6) —
(7) 7	(7) 0.5	(7) BN / YE	(7) 585	(7) Transmission Fluid Temperature Sensor Signal	(7) I	(7) —
(8) 8	(8) 0.5	(8) OG	(8) 480	(8) Engine Control Vehicle Sensors 5 Volt Reference 1	(8) I	(8) —
(9) 9	(9) 0.5	(9) BN	(9) 6387	(9) Transmission High Side Driver 1 Control	(9) I	(9) —
10	—	—	—	Not Occupied	—	—
(11) 11	(11) 0.5	(11) WH	(11) 6388	(11) Transmission High Side Driver 2 Control	(11) I	(11) —
(12) 12	(12) 0.5	(12) BU	(12) 4171	(12) Transmission Input Shaft Speed Sensor Circuit 9V Reference	(12) I	(12) —
(13) 13	(13) 0.5	(13) GN	(13) 4170	(13) Transmission Output Shaft Speed Sensor Circuit 9V Reference	(13) I	(13) —

T12 Automatic Transmission X3



4757999

Connector Part Information

- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 2203990-2
- Service Connector: Service by Harness - See Part Catalog
- Description: 13-Way F 1.2 MCON Series(BN)

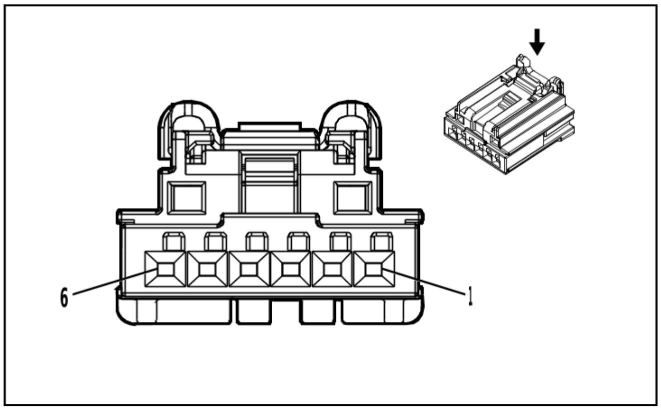
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

T12 Automatic Transmission X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / WH	(1) 4509	(1) Transmission Clutch F Control	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE / VT	(2) 4507	(2) Transmission Clutch H Control	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / GY	(3) 4508	(3) Transmission Clutch G Control	(3) I	(3) —
(4) 4	(4) 0.5	(4) GN / OG	(4) 1530	(4) Transmission Line Pressure Control Solenoid Valve Control	(4) I	(4) —
(5) 5	(5) 0.5	(5) GY / BN	(5) 422	(5) Torque Converter Clutch Solenoid Valve Control	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / BN	(6) 586	(6) Transmission Fluid Temperature Sensor Low Reference	(6) I	(6) —
(7) 7	(7) 0.5	(7) BU / GN	(7) 6404	(7) Clutch Solenoid Valve E Control	(7) I	(7) —
(8) 8	(8) 0.5	(8) GN / BN	(8) 6403	(8) Clutch Solenoid Valve D Control	(8) I	(8) —
(9) 9	(9) 0.5	(9) GY	(9) 6402	(9) Clutch Solenoid Valve C Control	(9) I	(9) —
10 - 11	—	—	—	Not Occupied	—	—
(12) 12	(12) 0.5	(12) VT	(12) 7819	(12) Default Disable Solenoid Control	(12) I	(12) —
(13) 13	(13) 0.5	(13) BK / GY	(13) 626	(13) Engine Control Vehicle Sensors Low Reference 1	(13) I	(13) —

T22 Wireless Accessory Charging Module



5020940

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 2035363-6
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

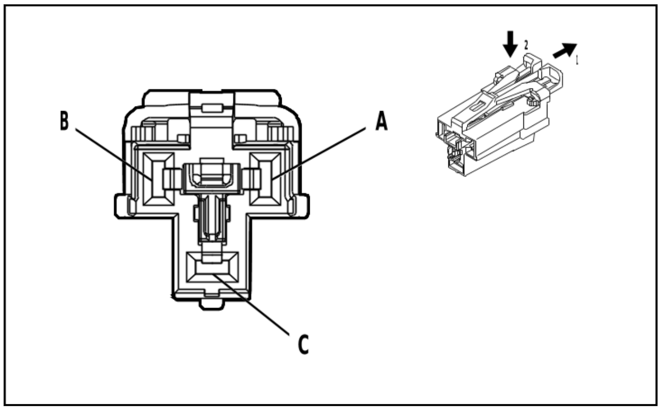
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

T22 Wireless Accessory Charging Module

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / VT	(1) 2640	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) BK	(2) 1350	(2) Ground	(2) I	(2) —
(3) 3	(3) 0.5	(3) BU / YE	(3) 4984	(3) AUTOSAR CAN Bus [-] 5 Serial Data	(3) I	(3) —
(4) 4	(4) 0.5	(4) BU / WH	(4) 4985	(4) AUTOSAR CAN Bus [+] 5 Serial Data	(4) I	(4) —
(5) 5	(5) 0.5	(5) BU / YE	(5) 4984	(5) AUTOSAR CAN Bus [-] 5 Serial Data	(5) I	(5) —
(6) 6	(6) 0.5	(6) BU / WH	(6) 4985	(6) AUTOSAR CAN Bus [+] 5 Serial Data	(6) I	(6) —

X80G Accessory Power Receptacle - Instrument Panel



4872413

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 33386302
- Service Connector: 19369281
- Description: 3-Way F 2.8 APEX Series(GY)

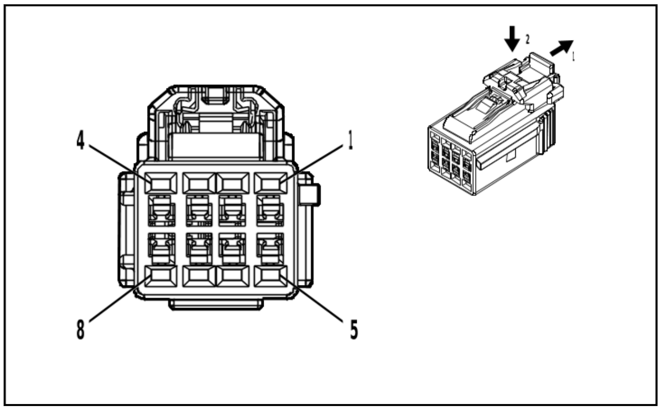
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required

X80G Accessory Power Receptacle - Instrument Panel

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	1.5	VT	1001	Retained Accessory Power Ignition Voltage	I	—
B	—	—	—	Not Occupied	—	—
C	1.5	BK	1050	Ground	I	—

X81ACA Front Floor Console Accessory Power Rear Receptacle - 110V AC (KI4)



5086387

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 6098-8443
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 1.2 Series(BK)

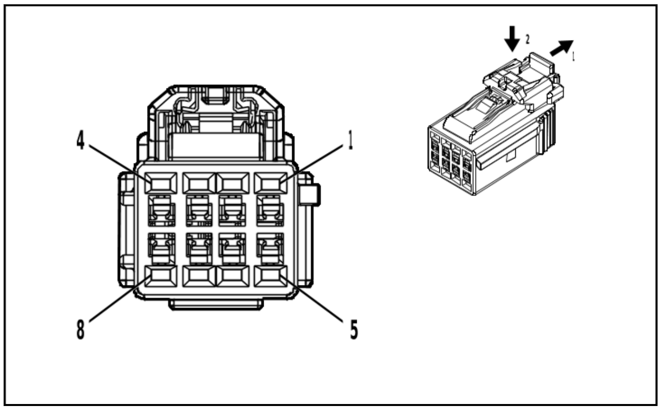
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required

X81ACA Front Floor Console Accessory Power Rear Receptacle - 110V AC (KI4)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) AC Outlet Phase A Control	(1) II	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) VT / RD	(3) 4049	(3) AC Power Outlet Sensor High Reference	(3) II	(3) —
(4) 4	(4) 0.5	(4) BU / BN	(4) 6807	(4) DC/AC Inverter Control	(4) II	(4) —
(5) 5	(5) 0.75	(5) RD	(5) 10118	(5) AC Outlet Phase B Control	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) BK	(7) 1350	(7) Ground	(7) II	(7) —
(8) 8	(8) 0.35	(8) YE	(8) 6817	(8) LED Backlight Dimming Control 1	(8) I	(8) —

X81AI Accessory Power Receptacle - Instrument Panel 110V AC



5086387

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8443
- Service Connector: 84613126
- Description: 8-Way F 1.2 Series(BK)

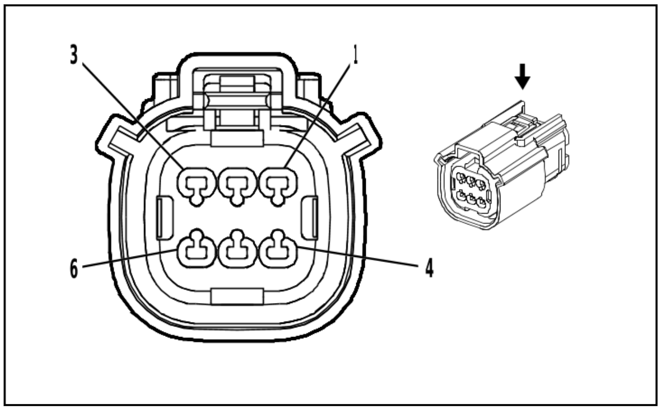
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required

X81AI Accessory Power Receptacle - Instrument Panel 110V AC

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) AC Outlet Phase A Control	(1) II	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) VT / RD	(3) 4049	(3) AC Power Outlet Sensor High Reference	(3) II	(3) —
(4) 4	(4) 0.5	(4) BU / BN	(4) 6807	(4) DC/AC Inverter Control	(4) II	(4) —
(5) 5	(5) 0.75	(5) RD	(5) 10118	(5) AC Outlet Phase B Control	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) BK	(7) 1050	(7) Ground	(7) II	(7) —
(8) 8	(8) 0.35	(8) YE	(8) 6817	(8) LED Backlight Dimming Control 1	(8) I	(8) —

X81AP Pickup Box Accessory Power Receptacle - 110V AC (KC9)



1986157

Connector Part Information
- Harness Type: Chassis Rear Wiring Harness
- OEM Connector: 33472-0616
- Service Connector: 13578533
- Description: 6-Way F 1.5 MX Series, Sealed(BK)

Terminal Part Information

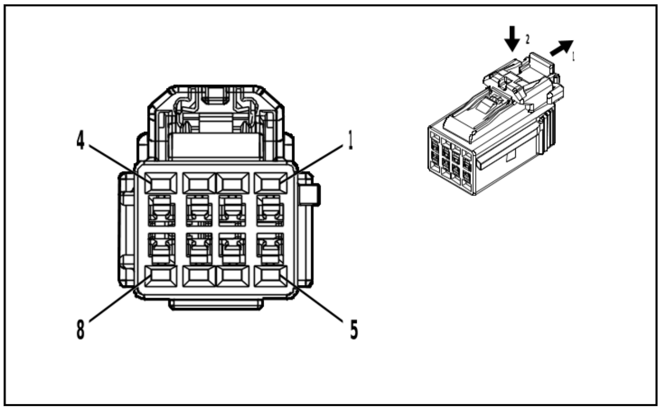
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

X81AP Pickup Box Accessory Power Receptacle - 110V AC (KC9)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / RD	(1) 4049	(1) AC Power Outlet Sensor High Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / BN	(2) 2266	(2) DC/AC Inverter Control 2	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.75	(4) BK / WH	(4) 10120	(4) AC Outlet 2 Phase A Control	(4) I	(4) —

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(5) 5	(5) 0.5	(5) BK	(5) 1750	(5) Ground	(5) I	(5) —
(6) 6	(6) 0.75	(6) RD / WH	(6) 10121	(6) AC Outlet 2 Phase B Control	(6) I	(6) —

X81BCA Front Floor Console Accessory Power Rear Receptacle - 220V AC (KI5)



5086387

Connector Part Information
- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 6098-8443
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 1.2 Series(BK)

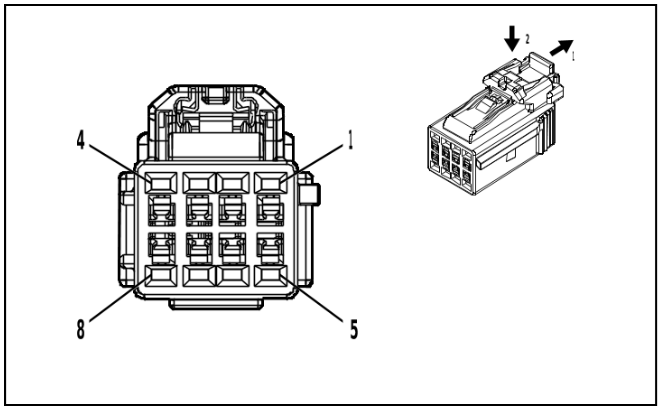
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required

X81BCA Front Floor Console Accessory Power Rear Receptacle - 220V AC (KI5)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) AC Outlet Phase A Control	(1) II	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) VT / RD	(3) 4049	(3) AC Power Outlet Sensor High Reference	(3) II	(3) —
(4) 4	(4) 0.5	(4) BU / BN	(4) 6807	(4) DC/AC Inverter Control	(4) II	(4) —
(5) 5	(5) 0.75	(5) RD	(5) 10118	(5) AC Outlet Phase B Control	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) BK	(7) 1350	(7) Ground	(7) II	(7) —
(8) 8	(8) 0.35	(8) YE	(8) 6817	(8) LED Backlight Dimming Control 1	(8) I	(8) —

X81BCA Front Floor Console Accessory Power Rear Receptacle - 220V AC (KI5 & D07)



5086387

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 35029311
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 1.2 Series(BK)

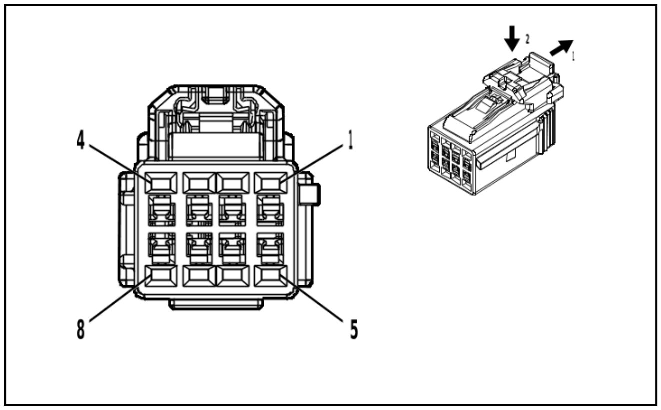
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required

X81BCA Front Floor Console Accessory Power Rear Receptacle - 220V AC (KI5 & D07)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) —	(1) BK	(1) 10117	(1) AC Outlet Phase A Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) —	(3) VT / RD	(3) 4049	(3) AC Power Outlet Sensor High Reference	(3) I	(3) —
(4) 4	(4) —	(4) BU / BN	(4) 6807	(4) DC/AC Inverter Control	(4) I	(4) —
(5) 5	(5) —	(5) RD	(5) 10118	(5) AC Outlet Phase B Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) —	(7) BK	(7) 1350	(7) Ground	(7) I	(7) —
(8) 8	(8) —	(8) YE	(8) 6817	(8) LED Backlight Dimming Control 1	(8) I	(8) —

X81BI Accessory Power Receptacle - Instrument Panel 220V AC



5086387

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8443
- Service Connector: 84613126
- Description: 8-Way F 1.2 Series(BK)

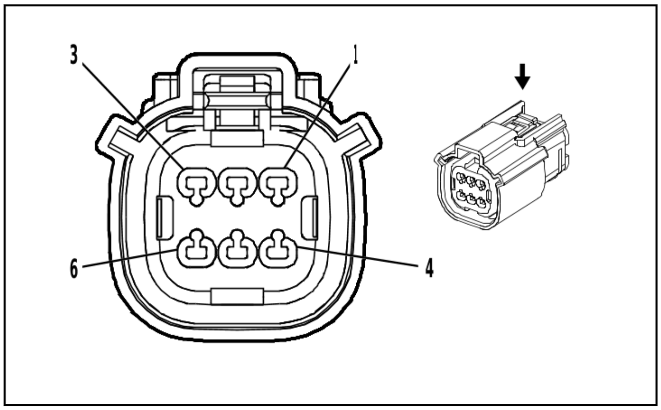
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required

X81BI Accessory Power Receptacle - Instrument Panel 220V AC

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) AC Outlet Phase A Control	(1) II	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.5	(3) VT / RD	(3) 4049	(3) AC Power Outlet Sensor High Reference	(3) II	(3) —
(4) 4	(4) 0.5	(4) BU / BN	(4) 6807	(4) DC/AC Inverter Control	(4) II	(4) —
(5) 5	(5) 0.75	(5) RD	(5) 10118	(5) AC Outlet Phase B Control	(5) II	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.5	(7) BK	(7) 1050	(7) Ground	(7) II	(7) —
(8) 8	(8) 0.35	(8) YE	(8) 6817	(8) LED Backlight Dimming Control 1	(8) I	(8) —

X81BP Pickup Box Accessory Power Receptacle - 220V AC (KCA)



1986157

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness
- OEM Connector: 33472-0616
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 1.5 MX Series, Sealed(BK)

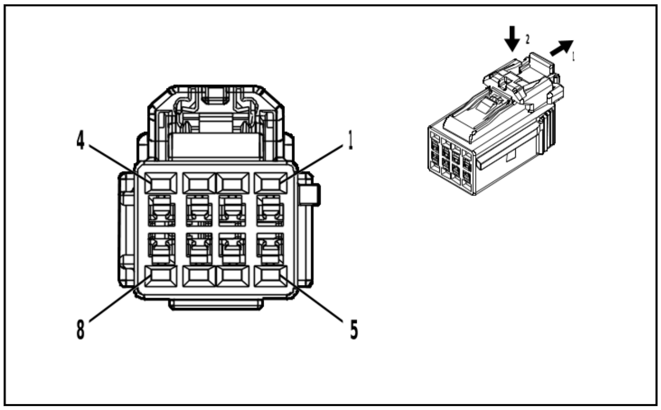
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required

X81BP Pickup Box Accessory Power Receptacle - 220V AC (KCA)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / RD	(1) 4049	(1) AC Power Outlet Sensor High Reference	(1) I	(1) —
(2) 2	(2) 0.5	(2) GN / BN	(2) 2266	(2) DC/AC Inverter Control 2	(2) I	(2) —
3	—	—	—	Not Occupied	—	—
(4) 4	(4) 0.75	(4) BK / WH	(4) 10120	(4) AC Outlet 2 Phase A Control	(4) I	(4) —
(5) 5	(5) 0.5	(5) BK	(5) 1750	(5) Ground	(5) I	(5) —
(6) 6	(6) 0.75	(6) RD / WH	(6) 10121	(6) AC Outlet 2 Phase B Control	(6) I	(6) —

X81FSA Accessory Power Receptacle - Front Center Seat Rear Cover 110V AC (KI4)



5086387

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Center
- OEM Connector: 6098-8443
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 1.2 Series(BK)

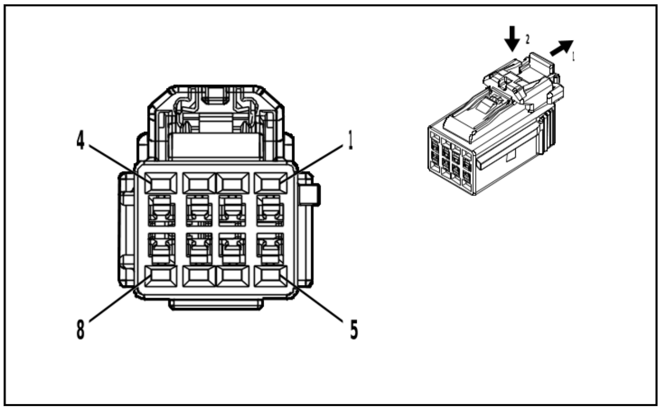
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

X81FSA Accessory Power Receptacle - Front Center Seat Rear Cover 110V AC (KI4)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) AC Outlet Phase A Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.75	(3) VT / RD	(3) 4049	(3) AC Power Outlet Sensor High Reference	(3) I	(3) —
(4) 4	(4) 0.75	(4) BU / BN	(4) 6807	(4) DC/AC Inverter Control	(4) I	(4) —
(5) 5	(5) 0.75	(5) RD	(5) 10118	(5) AC Outlet Phase B Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.75	(7) BK	(7) 1050	(7) Ground	(7) I	(7) —
(8) 8	(8) 0.35	(8) YE	(8) 6817	(8) LED Backlight Dimming Control 1	(8) I	(8) —

X81FSB Accessory Power Receptacle - Front Center Seat Rear Cover 220V AC (KI5)



5086387

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Center
- OEM Connector: 6098-8443
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F 1.2 Series(BK)

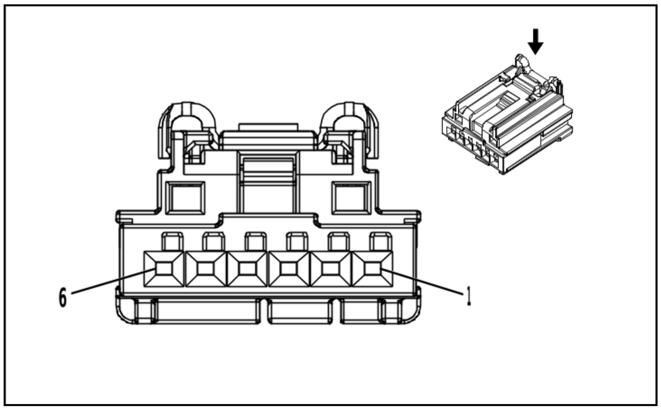
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required

X81FSB Accessory Power Receptacle - Front Center Seat Rear Cover 220V AC (KI5)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) AC Outlet Phase A Control	(1) I	(1) —
2	—	—	—	Not Occupied	—	—
(3) 3	(3) 0.75	(3) VT / RD	(3) 4049	(3) AC Power Outlet Sensor High Reference	(3) I	(3) —
(4) 4	(4) 0.75	(4) BU / BN	(4) 6807	(4) DC/AC Inverter Control	(4) I	(4) —
(5) 5	(5) 0.75	(5) RD	(5) 10118	(5) AC Outlet Phase B Control	(5) I	(5) —
6	—	—	—	Not Occupied	—	—
(7) 7	(7) 0.75	(7) BK	(7) 1350	(7) Ground	(7) I	(7) —
(8) 8	(8) 0.35	(8) YE	(8) 6817	(8) LED Backlight Dimming Control 1	(8) I	(8) —

X83B Audio/Video Receptacle X1



3960313

Connector Part Information
- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 2035363-4
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

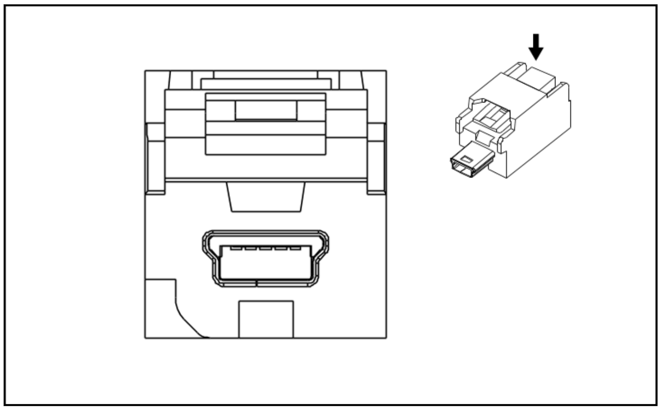
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

X83B Audio/Video Receptacle X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / VT	(1) 2640	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.35 (2) 0.5	(2) YE (2) YE	(2) 6817 (2) 6817	(2) LED Backlight Dimming Control 1 (2) LED Backlight Dimming Control 1	(2) I (2) I	(2) — (2) —
(3) 3	(3) 0.5	(3) BK / WH	(3) 1051	(3) Signal Ground	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—

X83B Audio/Video Receptacle X2



3214018

Connector Part Information
- Harness Type: Front Floor Console Wiring Harness USB
- OEM Connector: 13890926
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 5-Way M 2.0 Mini-B USB Type(GY)

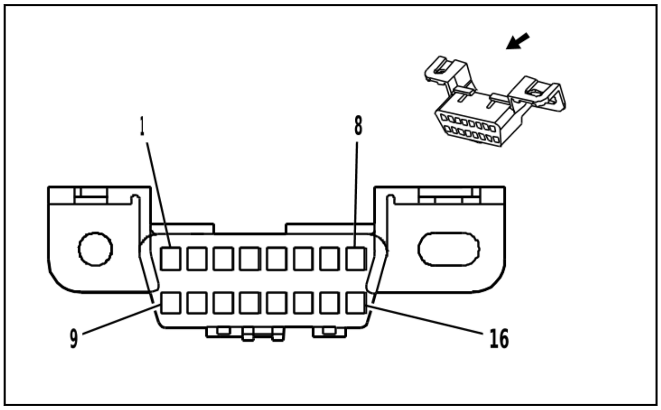
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X83B Audio/Video Receptacle X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	USB	—	USB Serial Data	I	—

X84 Data Link Connector



68793

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 12110250
- Service Connector: 12110250
- Description: 16-Way F 150 Metri-Pack Series(BK)

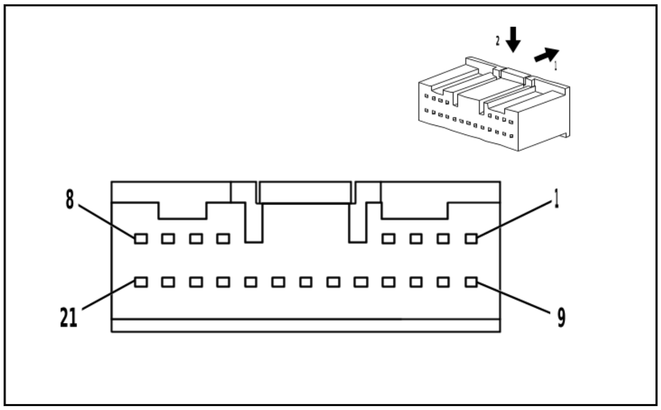
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13580059	J-35616-14 (GN)	J-38125-12A
II	Service by Cable	J-35616-14 (GN)	EL-38215-215A

X84 Data Link Connector

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BU / BN	(1) 4983	(1) AUTOSAR CAN Bus [+] 7 Serial Data	(1) I	(1) —
(2) 2	(2) 0.35	(2) GN	(2) 2578	(2) Private Serial Data Presentation CAN Bus [+] 1 Serial Data	(2) I	(2) —
(3) 3	(3) 0.35	(3) BU	(3) 4973	(3) Ethernet Bus 1R [+]	(3) II	(3) —
(4) 4	(4) 0.5	(4) BK	(4) 1050	(4) Ground	(4) I	(4) —
(5) 5	(5) 0.5	(5) BK / WH	(5) 851	(5) Signal Ground	(5) I	(5) —
(6) 6	(6) 0.35	(6) YE	(6) 4981	(6) AUTOSAR CAN Bus [+] 6 Serial Data	(6) I	(6) —
(7) 7	(7) 0.35	(7) VT	(7) 2580	(7) Private Serial Data Presentation CAN Bus [+] 2 Serial Data	(7) I	(7) —
(8) 8	(8) 0.35	(8) WH	(8) 7207	(8) Ethernet Bus 1 Enable Signal	(8) I	(8) —
(9) 9	(9) 0.35	(9) WH	(9) 4982	(9) AUTOSAR CAN Bus [-] 7 Serial Data	(9) I	(9) —
(10) 10	(10) 0.35	(10) BN	(10) 2577	(10) Private Serial Data Presentation CAN Bus [-] 1 Serial Data	(10) I	(10) —
(11) 11	(11) 0.35	(11) YE	(11) 4972	(11) Ethernet Bus 1R [-]	(11) II	(11) —
(12) 12	(12) 0.35	(12) BU	(12) 4975	(12) Ethernet Bus 1T [+]	(12) II	(12) —
(13) 13	(13) 0.35	(13) GN	(13) 4974	(13) Ethernet Bus 1T [-]	(13) II	(13) —
(14) 14	(14) 0.35	(14) WH	(14) 4980	(14) AUTOSAR CAN Bus [-] 6 Serial Data	(14) I	(14) —
(15) 15	(15) 0.35	(15) GY	(15) 2579	(15) Private Serial Data Presentation CAN Bus [-] 2 Serial Data	(15) I	(15) —
(16) 16	(16) 0.5	(16) RD / YE	(16) 6540	(16) Battery Positive Voltage	(16) I	(16) —

X85 Steering Wheel Airbag Coil X1



3960237

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: ATLCPB-21B-2AY
- Service Connector: 13510218
- Description: 21-Way F 0.64 Series(YE)

Terminal Part Information

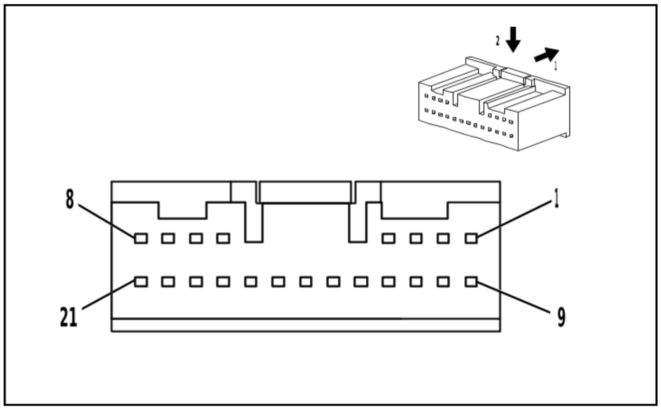
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13575742	J-35616-64B (L-BU)	J-38125-215A
II	13575865	J-35616-64B (L-BU)	J-38125-215A

X85 Steering Wheel Airbag Coil X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK / WH	(1) 851	(1) Signal Ground	(1) I	(1) —
(2) 2	(2) 0.35	(2) GN / WH	(2) 3287	(2) Horn Switch Signal	(2) I	(2) —
3 - 4	—	—	—	Not Occupied	—	—
(5) 5	(5) 0.35	(5) OG / GN	(5) 3023	(5) Steering Wheel Air Bag Stage 2 High Control	(5) II	(5) —
(6) 6	(6) 0.35	(6) WH / OG	(6) 3022	(6) Steering Wheel Air Bag Stage 2 Low Control	(6) II	(6) —
(7) 7	(7) 0.35	(7) BN / OG	(7) 3020	(7) Steering Wheel Air Bag Stage 1 Low Control	(7) II	(7) —
(8) 8	(8) 0.35	(8) OG / VT	(8) 3021	(8) Steering Wheel Air Bag Stage 1 High Control	(8) II	(8) —
(9) 9	(9) 0.5	(9) GN / BK	(9) 3894	(9) Instrument Panel Cluster Control Module LIN Bus 1	(9) I	(9) —
(10) 10	(10) 0.35	(10) GN / BK	(10) 2858	(10) Body Control Module LIN Bus 12	(10) I	(10) —
(11) 11	(11) 0.35	(11) BN / GN	(11) 1884	(11) Cruise Control Set/Coast/Resume/ Accelerate Switch Signal	(11) I	(11) —
(12) 12	(12) 0.35	(12) BK / VT	(12) 1449	(12) Steering Wheel Resistor Ladder Low Reference	(12) I	(12) —
13	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(14) 14	(14) 0.35	(14) RD / GN	(14) 5140	(14) Battery Positive Voltage	(14) I	(14) —
(15) 15	(15) 0.35	(15) GY / GN	(15) 5737	(15) Distance Sensing Cruise Control Gap Up/ Down Switch Signal	(15) I	(15) —
16	—	—	—	Not Occupied	—	—
(17) 17	(17) 0.35	(17) YE	(17) 6817	(17) LED Backlight Dimming Control 1	(17) I	(17) —
18 - 19	—	—	—	Not Occupied	—	—
(20) 20	(20) 0.5	(20) BK	(20) 1050	(20) Ground	(20) I	(20) —
(21) 21	(21) 0.5	(21) RD / BN	(21) 10040	(21) Battery Positive Voltage	(21) I	(21) —

X85 Steering Wheel Airbag Coil X2



3960237

Connector Part Information

- Harness Type: Steering Wheel Horn Switch Wiring Harness
- OEM Connector: 13510218
- Service Connector: Service by Harness - See Part Catalog
- Description: 21-Way F 0.64 Series(YE)

Terminal Part Information

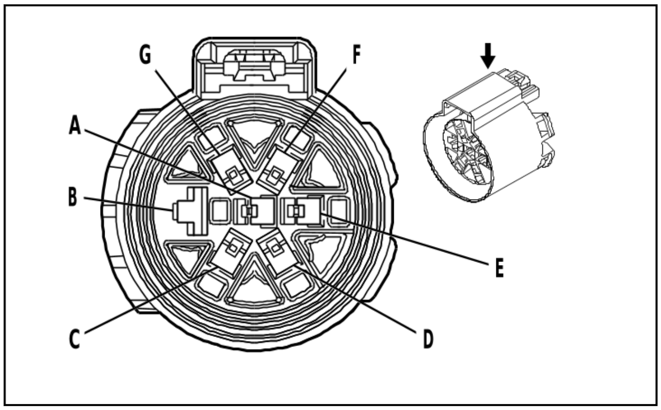
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

X85 Steering Wheel Airbag Coil X2

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) BK / WH	(1) 6051	(1) Steering Wheel Ground	(1) I	(1) —
(2) 2	(2) 0.35 (2) 0.35	(2) RD (2) GN / WH	(2) 3287 (2) 3287	(2) Horn Switch Signal (2) Horn Switch Signal	(2) I (2) I	(2) KI3 (2) - KI3
3 - 4	—	—	—	Not Occupied	—	—

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(5) 5	(5) 0.5 (5) 0.5	(5) GY / OG (5) OG / GN	(5) 3023 (5) 3023	(5) Steering Wheel Air Bag Stage 2 High Control (5) Steering Wheel Air Bag Stage 2 High Control	(5) I (5) I	(5) KI3 (5) - KI3
(6) 6	(6) 0.5 (6) 0.5	(6) OG / VT (6) WH / OG	(6) 3022 (6) 3022	(6) Steering Wheel Air Bag Stage 2 Low Control (6) Steering Wheel Air Bag Stage 2 Low Control	(6) I (6) I	(6) KI3 (6) - KI3
(7) 7	(7) 0.5 (7) 0.5	(7) OG / WH (7) BN / OG	(7) 3020 (7) 3020	(7) Steering Wheel Air Bag Stage 1 Low Control (7) Steering Wheel Air Bag Stage 1 Low Control	(7) I (7) I	(7) KI3 (7) - KI3
(8) 8	(8) 0.5 (8) 0.5	(8) YE / OG (8) OG / VT	(8) 3021 (8) 3021	(8) Steering Wheel Air Bag Stage 1 High Control (8) Steering Wheel Air Bag Stage 1 High Control	(8) I (8) I	(8) KI3 (8) - KI3
(9) 9	(9) 0.5	(9) OG	(9) 10040	(9) Battery Positive Voltage	(9) I	(9) —
(10) 10	(10) 0.5	(10) BK	(10) 6050	(10) Steering Wheel Ground	(10) I	(10) —
11 - 12	—	—	—	Not Occupied	—	—
(13) 13	(13) 0.35	(13) PK	(13) 6817	(13) LED Backlight Dimming Control 1	(13) I	(13) —
14	—	—	—	Not Occupied	—	—
(15) 15	(15) 0.35	(15) GY / GN	(15) 5737	(15) Distance Sensing Cruise Control Gap Up/ Down Switch Signal	(15) I	(15) —
(16) 16	(16) 0.35 (16) 0.35	(16) GN (16) RD / GN	(16) 5140 (16) 40	(16) Battery Positive Voltage (16) Battery Positive Voltage	(16) I (16) I	(16) KI3 (16) - KI3
17	—	—	—	Not Occupied	—	—
(18) 18	(18) 0.35	(18) BK / VT	(18) 1449	(18) Steering Wheel Resistor Ladder Low Reference	(18) I	(18) —
(19) 19	(19) 0.35 (19) 0.35	(19) GN / OG (19) BN / GN	(19) 1884 (19) 1884	(19) Cruise Control Set/Coast/Resume/ Accelerate Switch Signal (19) Cruise Control Set/Coast/Resume/ Accelerate Switch Signal	(19) I (19) I	(19) KI3 (19) - KI3
(20) 20	(20) 0.35	(20) WH	(20) 2858	(20) Body Control Module LIN Bus 12	(20) I	(20) —
(21) 21	(21) 0.35	(21) BK / BU	(21) 3894	(21) Instrument Panel Cluster Control Module LIN Bus 1	(21) I	(21) KI3

X88B Tow Vehicle Electrical Receptacle X1 ((UY2 / Z82 / 8S3) - UET)



2056936

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13857223
- Service Connector: 86816072
- Description: 7-Way F 280, 630 Metri-Pack Series, Sealed(BK)

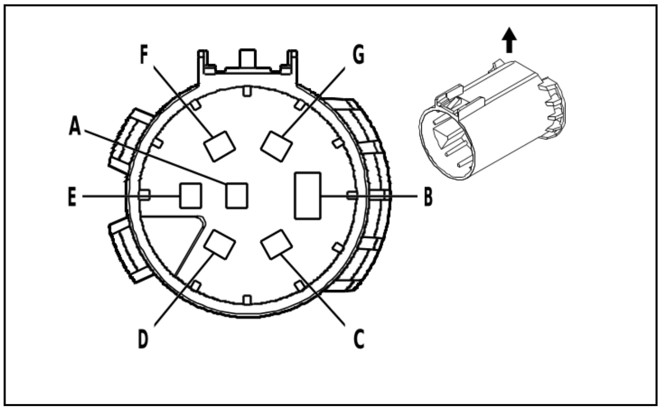
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

X88B Tow Vehicle Electrical Receptacle X1 ((UY2 / Z82 / 8S3) - UET)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	1 1	GY GY	5189 1624	Trailer Backup Lamp Control Trailer Backup Lamp Control	II II	UET UY2/ Z6A
B	5	WH	22	Trailer Ground	I	—
C	4	BU	47	Trailer Auxiliary Control	II	—
D	1	GN	1619	Right Rear Trailer Stop/Turn Lamp Control	II	—
E	4 4	OG OG	3940 3640	Battery Positive Voltage Battery Positive Voltage	II II	UET UY2/ Z6A
F	1 1.5	BN BN	2109 2109	Trailer Park Lamp Control Trailer Park Lamp Control	II II	UET UY2/ Z6A
G	1	YE	1618	Left Rear Trailer Stop/Turn Lamp Control	II	—

X88B Tow Vehicle Electrical Receptacle X1 (8S3)



366087

Connector Part Information

- Harness Type: Backup Alarm Wiring Harness
- OEM Connector: 15317327
- Service Connector: Service by Harness - See Part Catalog
- Description: 7-Way M 280 Metri-Pack Series, Sealed(BK)

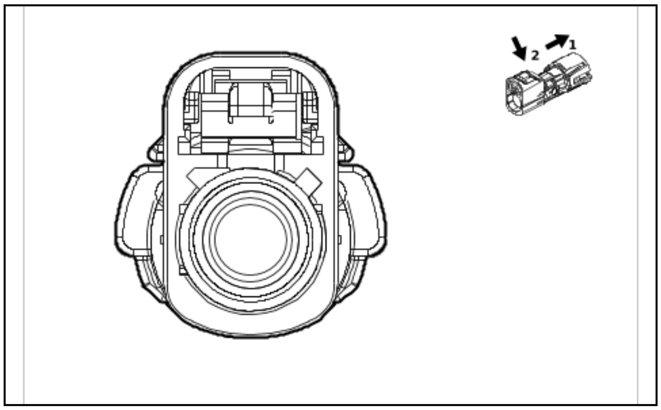
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-43 (RD)	No Tool Required
II	Not required	J-35616-5 (PU)	No Tool Required

X88B Tow Vehicle Electrical Receptacle X1 (8S3)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	1	WH / GN	1624	Trailer Backup Lamp Control	II	—
B	5	WH	22	Trailer Ground	I	—
C	3	BU	47	Trailer Auxiliary Control	II	—
D	1	GN	1619	Right Rear Trailer Stop/Turn Lamp Control	II	—
E	3	OG	3640	Battery Positive Voltage	II	—
F	1.5	BN	2109	Trailer Park Lamp Control	II	—
G	1	YE	1618	Left Rear Trailer Stop/Turn Lamp Control	II	—

X88B Tow Vehicle Electrical Receptacle X2 (TRG & UV2)



5758030

Connector Part Information
- Harness Type: Chassis Wiring Harness COAX
- OEM Connector: 35187032
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

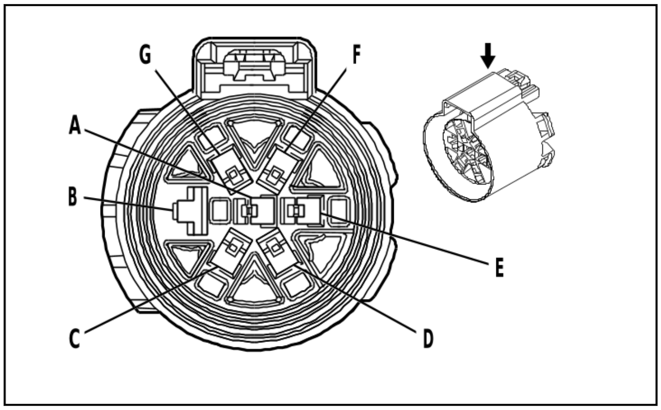
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X88B Tow Vehicle Electrical Receptacle X2 (TRG & UV2)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Trailer Rear Vision Camera Coaxial Video Signal	I	—

X88B Tow Vehicle Electrical Receptacle X2 (Z6A)



2056936

Connector Part Information
- Harness Type: Trailer Rear Wiring Harness
- OEM Connector: 13857223
- Service Connector: Service by Harness - See Part Catalog
- Description: 7-Way F 280, 630 Metri-Pack Series, Sealed(BK)

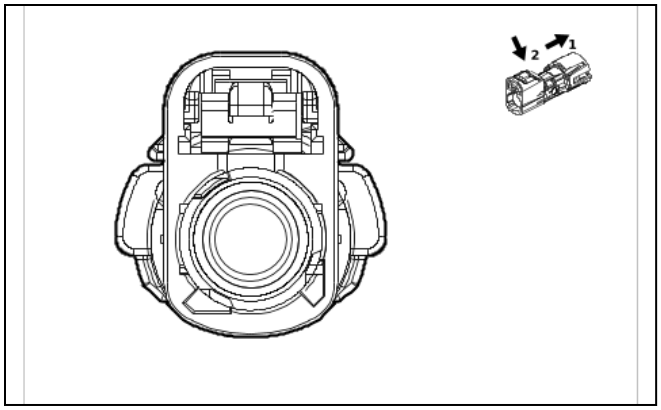
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

X88B Tow Vehicle Electrical Receptacle X2 (Z6A)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	1	GY	1624	Trailer Backup Lamp Control	II	—
B	5	WH	22	Trailer Ground	I	—
C	4	BU	47	Trailer Auxiliary Control	II	—
D	1	GN	1619	Right Rear Trailer Stop/Turn Lamp Control	II	—
E	4	OG	3640	Battery Positive Voltage	II	—
F	1.5	BN	2109	Trailer Park Lamp Control	II	—
G	1	YE	1618	Left Rear Trailer Stop/Turn Lamp Control	II	—

X88B Tow Vehicle Electrical Receptacle X3



5757455

Connector Part Information

- Harness Type: Chassis Wiring Harness COAX
- OEM Connector: 35187043
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(OG)

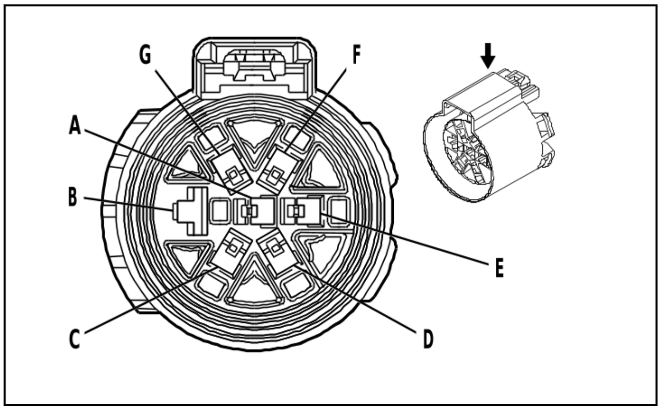
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X88B Tow Vehicle Electrical Receptacle X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	Coax Cable	—	Trailer 2 Rear Vision Camera Coaxial Video Signal	I	—

X88GB Tow Vehicle Electrical Receptacle - 5th Wheel/Camper



2056936

Connector Part Information

- Harness Type: Trailer Rear Wiring Harness
- OEM Connector: 13857223
- Service Connector: Service by Harness - See Part Catalog
- Description: 7-Way F 280, 630 Metri-Pack Series, Sealed(BK)

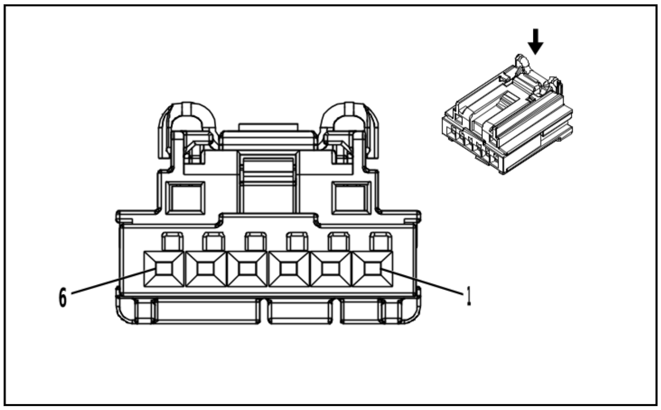
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required

X88GB Tow Vehicle Electrical Receptacle - 5th Wheel/Camper

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
A	1	GY	1624	Trailer Backup Lamp Control	II	—
B	5	WH	22	Trailer Ground	I	—
C	4	BU	47	Trailer Auxiliary Control	II	—
D	1	GN	1619	Right Rear Trailer Stop/Turn Lamp Control	II	—
E	4	OG	3640	Battery Positive Voltage	II	—
F	1.5	BN	2109	Trailer Park Lamp Control	II	—
G	1	YE	1618	Left Rear Trailer Stop/Turn Lamp Control	II	—

X92CD Dual Charge Only Receptacle - Floor Console Rear



3960313

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 2035363-4
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

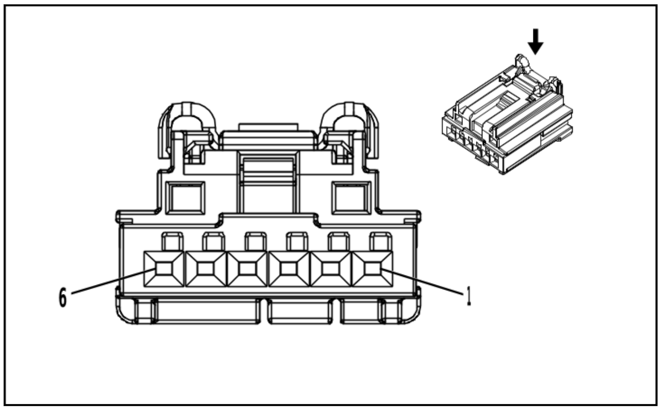
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

X92CD Dual Charge Only Receptacle - Floor Console Rear

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) VT	(1) 4701	(1) Retained Accessory Power Control	(1) I	(1) —
(2) 2	(2) 0.35	(2) YE	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK	(3) 1350	(3) Ground	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—

X92FSR Dual Charge Only Receptacle - Front Center Seat Rear Cover



3960313

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Center
- OEM Connector: 2035363-4
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 0.64 Generation Y Series(BK)

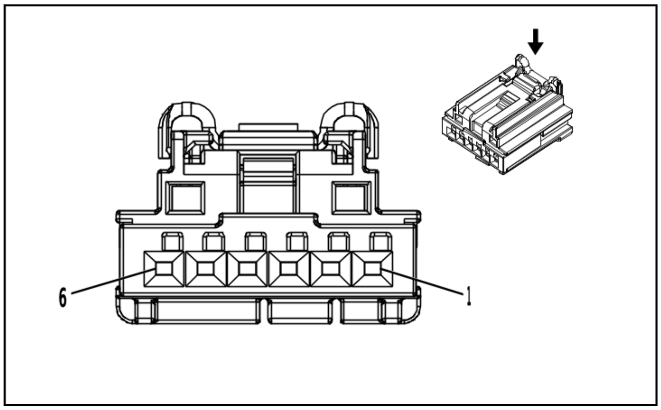
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

X92FSR Dual Charge Only Receptacle - Front Center Seat Rear Cover

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) VT	(1) 4701	(1) Retained Accessory Power Control	(1) I	(1) —
(2) 2	(2) 0.35	(2) YE	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.35	(3) BK	(3) 1350	(3) Ground	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—

X92IP USB 2 Port Receptacle - Instrument Panel X1



3960313

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 2035363-4
- Service Connector: 19332786
- Description: 6-Way F 0.64 Generation Y Series(BK)

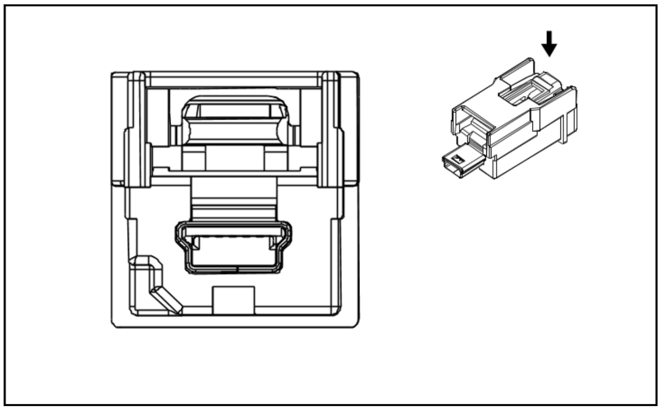
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-64B (L-BU)	No Tool Required

X92IP USB 2 Port Receptacle - Instrument Panel X1

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / VT	(1) 2640	(1) Battery Positive Voltage	(1) I	(1) —
(2) 2	(2) 0.5	(2) YE	(2) 6817	(2) LED Backlight Dimming Control 1	(2) I	(2) —
(3) 3	(3) 0.75	(3) BK / WH	(3) 1051	(3) Signal Ground	(3) I	(3) —
4 - 6	—	—	—	Not Occupied	—	—

X92IP USB 2 Port Receptacle - Instrument Panel X2 (IOK)



2807491

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness USB
- OEM Connector: 111014-9001
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 5-Way M 2.0 Mini-B USB Type(GY)

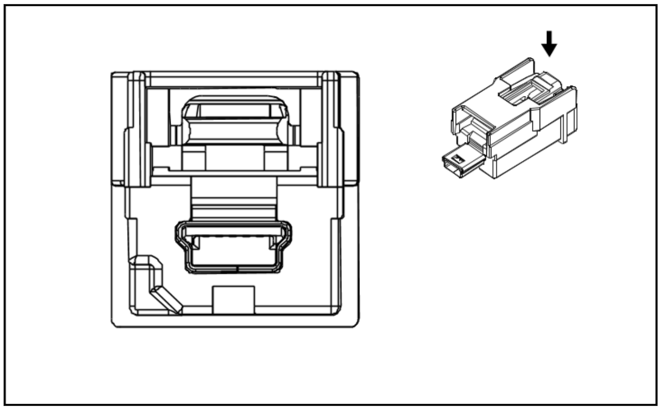
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X92IP USB 2 Port Receptacle - Instrument Panel X2 (IOK)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	USB	—	USB Serial Data	I	—

X92IP USB 2 Port Receptacle - Instrument Panel X2 (IOR)



2807491

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness USB
- OEM Connector: 111014-9501
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 5-Way M 2.0 Mini-B USB Type(GY)

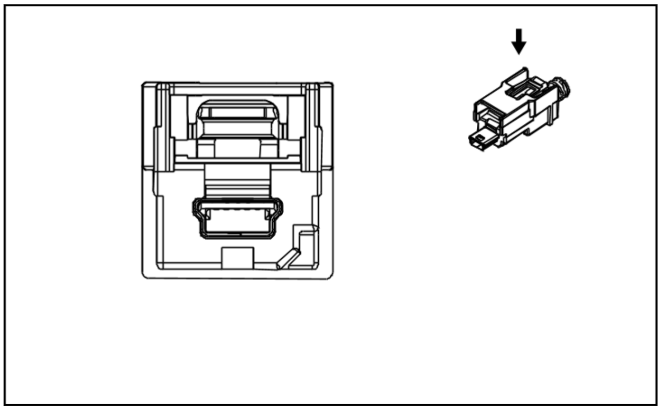
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X92IP USB 2 Port Receptacle - Instrument Panel X2 (IOR)

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
—	—	USB	—	USB Serial Data	I	—

X92IP USB 2 Port Receptacle - Instrument Panel X3



2807425

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 13576672
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 5-Way M 2.0 Mini-B USB Type(BK)

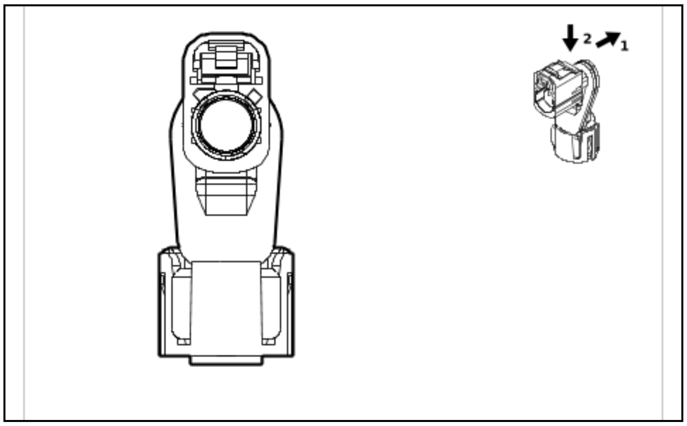
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X92IP USB 2 Port Receptacle - Instrument Panel X3

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
BK	—	<p01>	USB	USB Serial Data	I	—

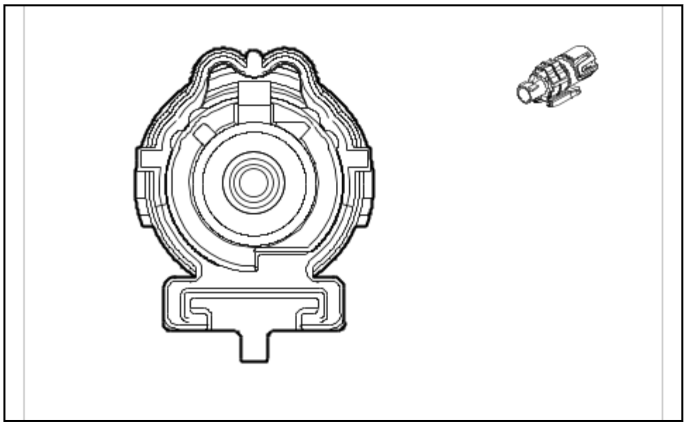
X122 Front View Camera Switch Wiring Harness to Body Wiring Harness



5920539

Connector Part Information

- Harness Type: Front View Camera Switch Wiring Harness COAX
- OEM Connector: 13537644
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)



5758019

Connector Part Information

- Harness Type: Body Wiring Harness COAX
- OEM Connector: 33338239
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way M Coax Type, Sealed(BK)

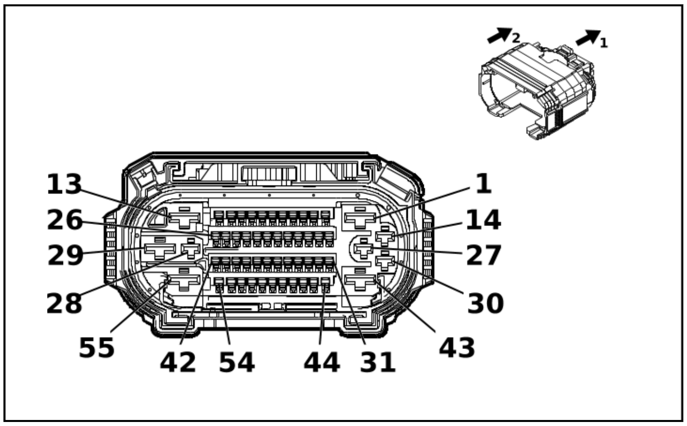
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X122 Front View Camera Switch Wiring Harness to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
—	—	Coax Cable	—	I	—	Front Vision Camera 1 Coaxial Video Signal	—	—	Coax Cable	—	I	—

X125 Body Wiring Harness to Engine Wiring Harness



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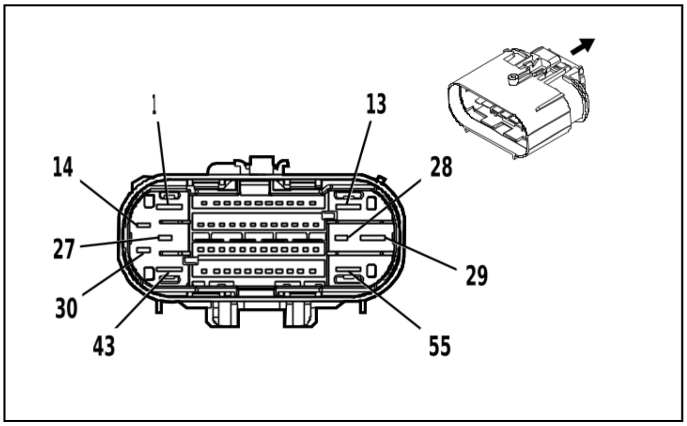


4994369

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35582969
- Service Connector: 19371184
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(GY)

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13530983
- Service Connector: 84727363
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(GY)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19332901	J-35616-35 (VT)	J-38125-212
II	19370818	J-35616-12 (BU)	J-38125-553
III	19371217	J-35616-12 (BU)	J-38125-553
IV	84634921	J-35616-42 (RD)	J-38125-212
V	84847992	J-35616-32 (OG)	J-38125-36
VI	84867140	J-35616-13 (BU)	J-38125-553
VII	84867141	J-35616-13 (BU)	J-38125-215A
VIII	84992391	J-35616-5 (PU)	J-38125-36

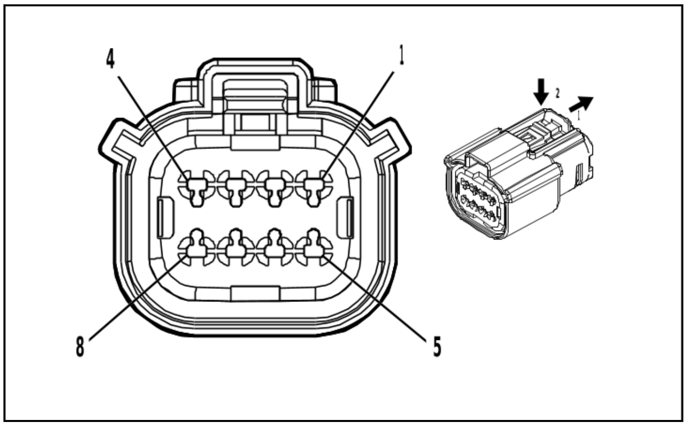
X125 Body Wiring Harness to Engine Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 4	(1) BK / WH	(1) 251	(1) IV	(1) —	(1) Signal Ground	(1) 1	(1) 4	(1) BK / WH	(1) 251	(1) V	(1) —
(2) 2	(2) 1.5	(2) RD / GN	(2) 1840	(2) III	(2) —	(2) Battery Positive Voltage	(2) 2	(2) 1.5	(2) RD / GN	(2) 1840	(2) VII	(2) —
(3) 3	(3) 0.5	(3) BN / GN	(3) 4311	(3) II	(3) —	(3) Power Take-Off Enable Cabin Switch Normally Closed Signal	(3) 3	(3) 0.5	(3) BN / GN	(3) 4311	(3) VI	(3) —
4 - 7	—	—	—	—	—	Not Occupied	4 - 7	—	—	—	—	—
(8) 8	(8) 0.35	(8) WH / RD	(8) 1164	(8) II	(8) —	(8) Accelerator Pedal Position 5V Reference 1	(8) 8	(8) 0.5	(8) WH / RD	(8) 1164	(8) VI	(8) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(9) 9	(9) 0.35	(9) BK / BU	(9) 1271	(9) II	(9) —	(9) Accelerator Pedal Position Low Reference 1	(9) 9	(9) 0.5	(9) BK / BU	(9) 1271	(9) VI	(9) —
(10) 10	(10) 0.35	(10) YE / WH	(10) 1161	(10) II	(10) —	(10) Accelerator Pedal Position Signal 1	(10) 10	(10) 0.5	(10) YE / WH	(10) 1161	(10) VI	(10) —
(11) 11	(11) 0.35	(11) GN / WH	(11) 1162	(11) II	(11) —	(11) Accelerator Pedal Position Signal 2	(11) 11	(11) 0.5	(11) GN / WH	(11) 1162	(11) VI	(11) —
(12) 12	(12) —	(12) —	(12) —	(12) —	(12) —	(12) —	(12) 12	(12) 1	(12) BK	(12) 9003	(12) VII	(12) —
(13) 13	(13) 0.5	(13) RD / BU	(13) 4540	(13) IV	(13) —	(13) Battery Positive Voltage	(13) 13	(13) 0.5	(13) RD / BU	(13) 4540	(13) V	(13) —
(14) 14	(14) 0.5	(14) RD / VT	(14) 2640	(14) I	(14) —	(14) Battery Positive Voltage	(14) 14	(14) 0.5	(14) RD / VT	(14) 2640	(14) VIII	(14) —
(15) 15	(15) 0.35	(15) BN / RD	(15) 1274	(15) II	(15) —	(15) Accelerator Pedal Position 5V Reference 2	(15) 15	(15) 0.5	(15) BN / RD	(15) 1274	(15) VI	(15) —
(16) 16	(16) 0.5	(16) YE	(16) 4063	(16) II	(16) —	(16) Hood Status A Signal	(16) 16	(16) 0.5	(16) YE	(16) 4063	(16) VI	(16) —
17	—	—	—	—	—	Not Occupied	17	—	—	—	—	—
(18) 18	(18) 0.35	(18) WH / RD	(18) 480	(18) II	(18) —	(18) Engine Control Vehicle Sensors 5 Volt Reference 1	(18) 18	(18) 0.5	(18) WH / RD	(18) 480	(18) VI	(18) —
(19) 19	(19) 0.35	(19) GN / BN	(19) 507	(19) II	(19) —	(19) Wait To Start Indicator Control	(19) 19	(19) 0.5	(19) GN / BN	(19) 507	(19) VI	(19) —
(20) 20	(20) 0.35	(20) WH / GN	(20) 5380	(20) II	(20) —	(20) Brake Position Sensor Signal	(20) 20	(20) 0.5	(20) WH / GN	(20) 5380	(20) VI	(20) —
21	—	—	—	—	—	Not Occupied	21	—	—	—	—	—
(22) 22	(22) 0.35	(22) BK / VT	(22) 1272	(22) II	(22) —	(22) Accelerator Pedal Position Low Reference 2	(22) 22	(22) 0.5	(22) BK / VT	(22) 1272	(22) VI	(22) —
(23) 23	(23) 0.5	(23) BK / GY	(23) 626	(23) II	(23) —	(23) Engine Control Vehicle Sensors Low Reference 1	(23) 23	(23) 0.5	(23) BK / GY	(23) 626	(23) VI	(23) —
24	—	—	—	—	—	Not Occupied	24	—	—	—	—	—
(25) 25	(25) 0.5	(25) BU / GY	(25) 636	(25) II	(25) —	(25) Ambient Air Temperature Sensor Signal	(25) 25	(25) 0.5	(25) BU / GY	(25) 636	(25) VI	(25) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(26) 26	(26) 0.5	(26) BU / BN	(26) 7573	(26) II	(26) —	(26) Air Conditioning Compressor Solenoid Valve Control	(26) 26	(26) 0.75	(26) BU / BN	(26) 7573	(26) VI	(26) —
(27) 27	(27) 0.5	(27) BU / YE	(27) 7574	(27) I	(27) —	(27) Air Conditioning Compressor Solenoid Valve Control	(27) 27	(27) 0.75	(27) BU / YE	(27) 7574	(27) VIII	(27) —
(28) 28	(28) 0.5	(28) GN / WH	(28) 488	(28) I	(28) —	(28) Power Take-Off Control Switch Signal	(28) 28	(28) 0.5	(28) GN / WH	(28) 488	(28) VIII	(28) —
29 - 32	—	—	—	—	—	Not Occupied	29 - 32	—	—	—	—	—
(33) 33	(33) 0.5	(33) VT / WH	(33) 239	(33) II	(33) —	(33) Run/ Crank Ignition 1 Voltage	(33) 33	(33) 0.5	(33) VT / WH	(33) 239	(33) VI	(33) —
(34) 34	(34) 0.5	(34) GY / BN	(34) 7065	(34) II	(34) —	(34) Right Front Wheel Speed Sensor Control	(34) 34	(34) 0.5	(34) GY / BN	(34) 7065	(34) VI	(34) —
(35) 35	(35) 0.5	(35) YE	(35) 872	(35) II	(35) —	(35) Right Front Wheel Speed Sensor Signal	(35) 35	(35) 0.5	(35) YE	(35) 872	(35) VI	(35) —
36 - 43	—	—	—	—	—	Not Occupied	36 - 43	—	—	—	—	—
(44) 44	(44) —	(44) —	(44) —	(44) —	(44) —	(44) —	(44) 44	(44) 1	(44) BK	(44) 9003	(44) VII	(44) —
45 - 46	—	—	—	—	—	Not Occupied	45 - 46	—	—	—	—	—
(47) 47	(47) 0.35	(47) BU / YE	(47) 68	(47) II	(47) —	(47) Low Coolant Level Indicator Control	(47) 47	(47) 0.5	(47) BU / YE	(47) 68	(47) VI	(47) —
48 - 52	—	—	—	—	—	Not Occupied	48 - 52	—	—	—	—	—
(53) 53	(53) 0.35	(53) BN / BU	(53) 4892	(53) II	(53) —	(53) Auxiliary Battery Relay Control	(53) 53	(53) 0.5	(53) BN / BU	(53) 4892	(53) VI	(53) —
(54) 54	(54) —	(54) —	(54) —	(54) —	(54) —	(54) —	(54) 54	(54) 1	(54) BK	(54) 9003	(54) VII	(54) —
55	—	—	—	—	—	Not Occupied	55	—	—	—	—	—

X128 Engine Wiring Harness to Camshaft Position Sensor Wire Harness (L8T)



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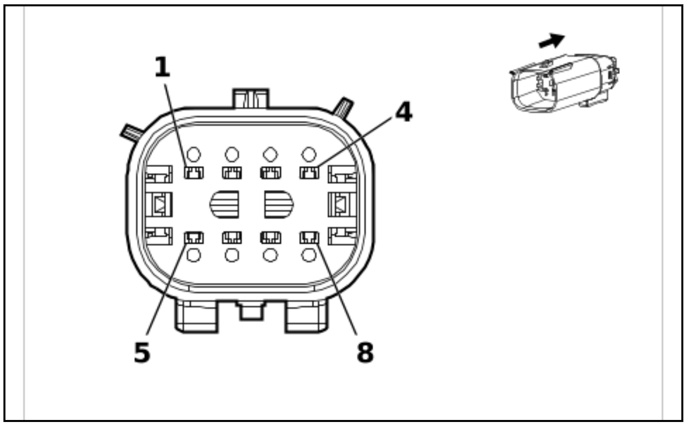


5429080

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 33472-4877
- Service Connector: 84928314
- Description: 8-Way F 1.5 MX Series, Sealed(BK)

Connector Part Information

- Harness Type: Camshaft Position Sensor Wire
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way M (BK)

Terminal Part Information

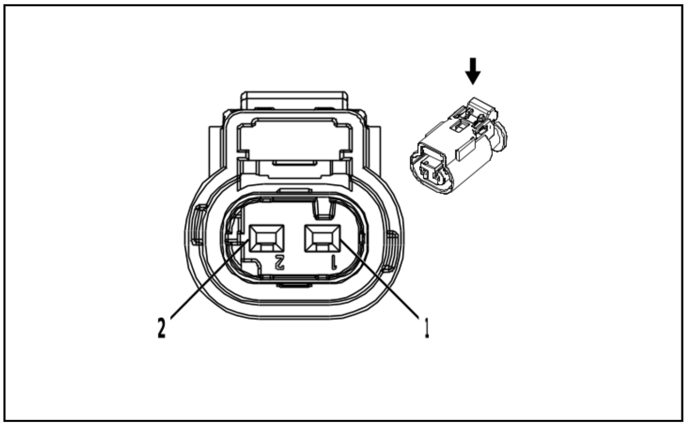
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	No Tool Required	No Tool Required

X128 Engine Wiring Harness to Camshaft Position Sensor Wire Harness (L8T)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / BU	(1) 5300	(1) I	(1) —	(1) Intake Camshaft Position Sensor 1 Voltage Reference	(1) 1	(1) 0.5	(1) GY / BU	(1) 5300	(1) II	(1) —
(2) 2	(2) 0.5	(2) BK / GN	(2) 5301	(2) I	(2) —	(2) Intake Camshaft Position Sensor Low Reference 1	(2) 2	(2) 0.5	(2) BK / GN	(2) 5301	(2) II	(2) —
(3) 3	(3) 0.5	(3) YE / VT	(3) 5275	(3) I	(3) —	(3) Intake Camshaft Position Sensor 1	(3) 3	(3) 0.5	(3) YE / VT	(3) 5275	(3) II	(3) —
(4) 4	(4) 0.5	(4) BU	(4) 179	(4) I	(4) —	(4) Engine Oil Pump Control	(4) 4	(4) 0.5	(4) BU	(4) 179	(4) II	(4) —
(5) 5	(5) 0.5	(5) VT / BN	(5) 5284	(5) I	(5) —	(5) Intake Camshaft Position Actuator Solenoid Valve 1	(5) 5	(5) 0.5	(5) VT / BN	(5) 5284	(5) II	(5) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(6) 6	(6) 0.5	(6) BK / BN	(6) 6753	(6) I	(6) —	(6) Camshaft Position Actuator Solenoid Valve 1 Low Reference	(6) 6	(6) 0.5	(6) BK / BN	(6) 6753	(6) II	(6) —
(7) 7	(7) 0.5	(7) VT / BU	(7) 5293	(7) I	(7) —	(7) Powertrain Main Relay Fused Supply Voltage 4	(7) 7	(7) 0.5	(7) VT / BU	(7) 5293	(7) II	(7) —
8	—	—	—	—	—	Not Occupied	8	—	—	—	—	—

X129 Camshaft Position Sensor Wire to Oil Pump Flow Control Solenoid Valve Wire



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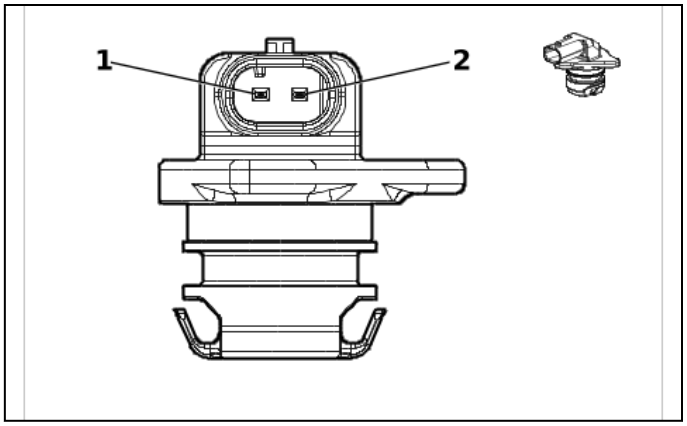


5869753

Connector Part Information
- Harness Type: Camshaft Position Sensor Wire
- OEM Connector: 13503566
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 Multilock Series, Sealed(BK)

Connector Part Information
- Harness Type: Oil Pump Flow Control Solenoid Valve Wire
- OEM Connector: 310832B
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 1.2 Series, Sealed(BK)

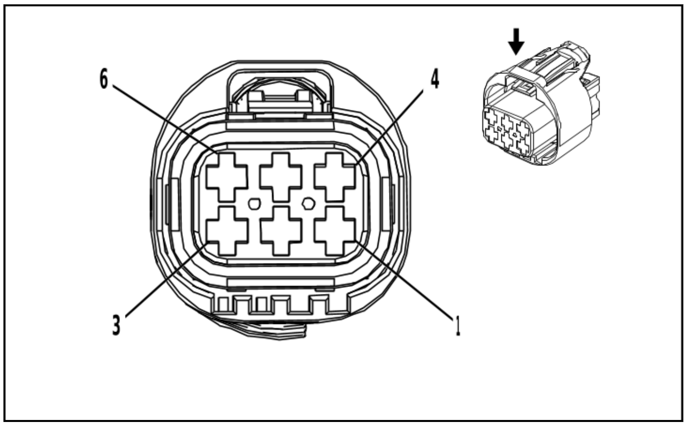
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-13 (BU)	No Tool Required

X129 Camshaft Position Sensor Wire to Oil Pump Flow Control Solenoid Valve Wire

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BU	(1) 5293	(1) I	(1) —	(1) Powertrain Main Relay Fused Supply Voltage 4	(1) 1	(1) 0.5	(1) VT / BU	(1) 5293	(1) II	(1) —
(2) 2	(2) 0.5	(2) BU	(2) 179	(2) I	(2) —	(2) Engine Oil Pump Control	(2) 2	(2) 0.5	(2) BU	(2) 179	(2) II	(2) —

X135 Engine Wiring Harness to Battery Positive Cable



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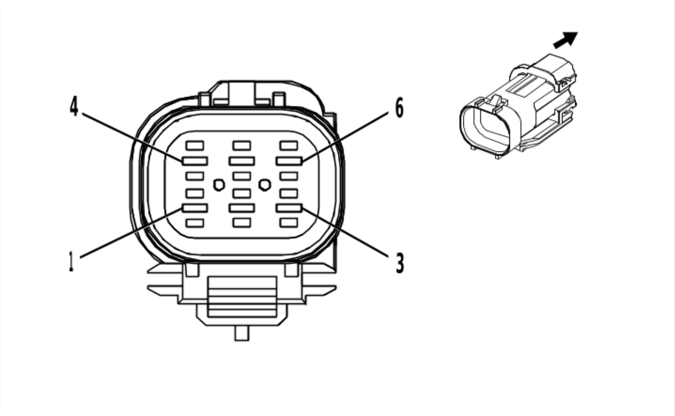


2042939

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 1452327-2
- Service Connector: 19332889
- Description: 6-Way F 2.8 Junior Power Timer Series, Sealed(GY)

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 13580778
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way M 2.8 Series, Sealed(BK)

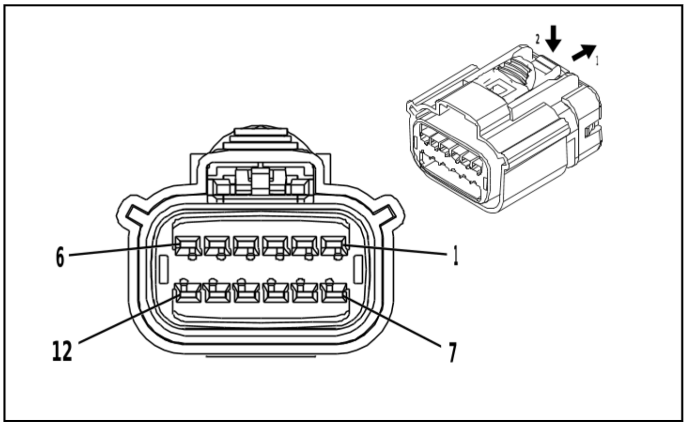
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required
II	Not required	J-35616-5 (PU)	No Tool Required

X135 Engine Wiring Harness to Battery Positive Cable

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN / BU	(1) 4892	(1) I	(1) —	(1) Auxiliary Battery Relay Control	(1) 1	(1) 0.5	(1) VT / BN	(1) 300	(1) II	(1) K4Z
2	—	—	—	—	—	Not Occupied	2	—	—	—	—	—
(3) 3	(3) 0.5	(3) RD / WH	(3) 3440	(3) I	(3) —	(3) Battery Positive Voltage	(3) 3	(3) 0.5	(3) RD / YE	(3) 4540	(3) II	(3) K4Z
(4) 4	(4) 1.5	(4) BK	(4) 450	(4) I	(4) —	(4) Ground	(4) 4	(4) 0.5 (4) 1	(4) BK (4) BK	(4) 450 (4) 450	(4) II (4) II	(4) K4Z (4) K4Z
5 - 6	—	—	—	—	—	Not Occupied	5 - 6	—	—	—	—	—

X150 Front Object Alarm Sensor Wiring Harness to Body Wiring Harness



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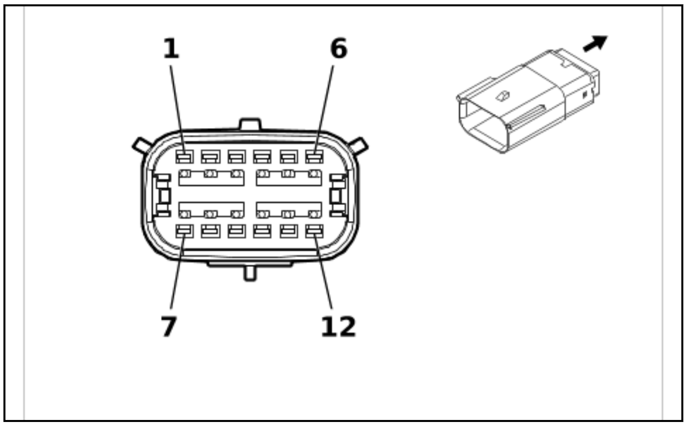


4862194

Connector Part Information

- Harness Type: Front Object Alarm Sensor Wiring Harness
- OEM Connector: 13590425
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way F 1.5 OCS Series, Sealed(BK)

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35600463
- Service Connector: 19371239
- Description: 12-Way M 1.5 OCS Series, Sealed(BK)

Terminal Part Information

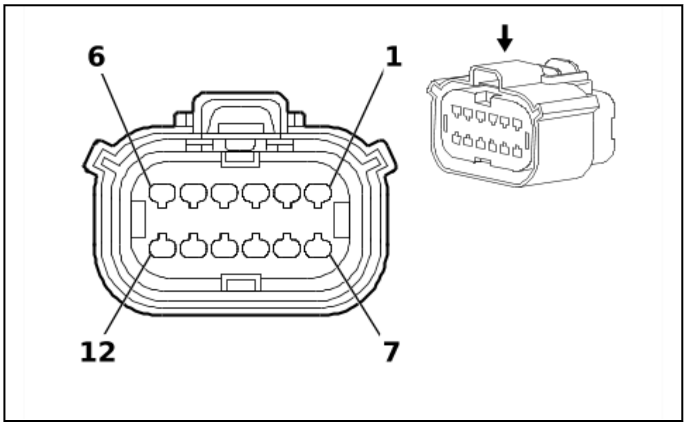
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	19352418	J-35616-3 (GY)	J-38125-215A

X150 Front Object Alarm Sensor Wiring Harness to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1 - 2	—	—	—	—	—	Not Occupied	1 - 2	—	—	—	—	—
(3) 3	(3) 0.5	(3) BK / BU	(3) 5214	(3) I	(3) —	(3) Front Parking Assist Sensor Low Reference	(3) 3	(3) 0.5	(3) BK / BU	(3) 5214	(3) II	(3) —
(4) 4	(4) 0.5	(4) VT / WH	(4) 5215	(4) I	(4) —	(4) Left Front Outer Parking Assist Sensor	(4) 4	(4) 0.5	(4) VT / WH	(4) 5215	(4) II	(4) —
(5) 5	(5) 0.5	(5) YE / GY	(5) 5216	(5) I	(5) —	(5) Left Front Middle Parking Assist Sensor	(5) 5	(5) 0.5	(5) YE / GY	(5) 5216	(5) II	(5) —
(6) 6	(6) 0.5	(6) WH / GY	(6) 5217	(6) I	(6) —	(6) Right Front Outer Parking Assist Sensor	(6) 6	(6) 0.5	(6) WH / GY	(6) 5217	(6) II	(6) —
(7) 7	(7) 0.5	(7) VT / GY	(7) 5218	(7) I	(7) —	(7) Right Front Middle Parking Assist Sensor	(7) 7	(7) 0.5	(7) VT / GY	(7) 5218	(7) II	(7) —
(8) 8	(8) 0.5	(8) BK	(8) 650	(8) I	(8) —	(8) Ground	(8) 8	(8) 0.5	(8) BK	(8) 650	(8) II	(8) —
9	—	—	—	—	—	Not Occupied	9	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(10) 10	(10) 0.5	(10) BN / GY	(10) 5061	(10) I	(10) —	(10) Left Front Fog Lamp Control	(10) 10	(10) 0.5	(10) BN / GY	(10) 5061	(10) II	(10) —
(11) 11	(11) 0.5	(11) BN	(11) 6581	(11) I	(11) —	(11) Front Parking Assist Display Control	(11) 11	(11) 0.5	(11) BN	(11) 6581	(11) II	(11) —
12	—	—	—	—	—	Not Occupied	12	—	—	—	—	—

X160 Engine Wiring Harness to Fuel Injector Wiring Harness - Left



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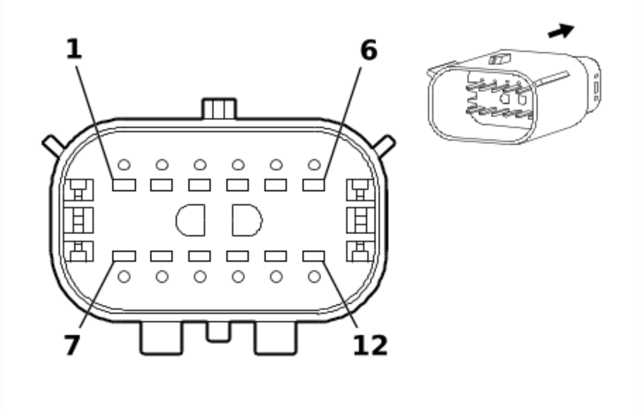


1825167

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 33472-1216
- Service Connector: 19352907
- Description: 12-Way F 1.5 MX Series, Sealed(BK)

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Left
- OEM Connector: 13520581
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way M 1.5 MX Series, Sealed(BK)

Terminal Part Information

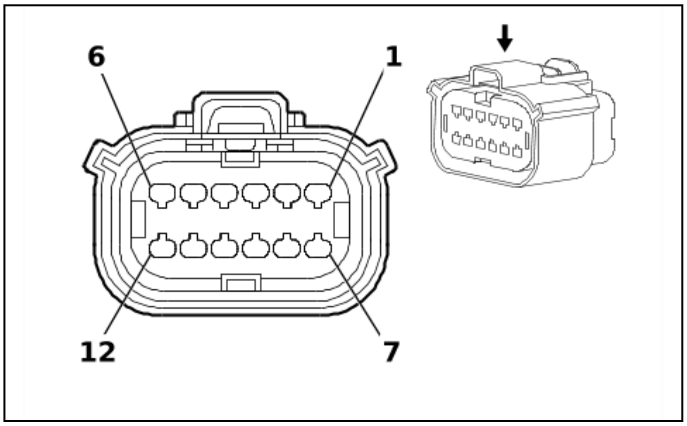
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85528055	J-35616-2A (GY)	J-38125-217
II	Not required	J-35616-3 (GY)	No Tool Required

X160 Engine Wiring Harness to Fuel Injector Wiring Harness - Left

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / WH	(1) 4901	(1) I	(1) —	(1) Direct Fuel Injector High Voltage Supply Cylinder 1	(1) 1	(1) 0.75	(1) BN / WH	(1) 4901	(1) II	(1) —
(2) 2	(2) 0.75	(2) GN / GY	(2) 4903	(2) I	(2) —	(2) Direct Fuel Injector High Voltage Supply Cylinder 3	(2) 2	(2) 0.75	(2) GN / GY	(2) 4903	(2) II	(2) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(3) 3	(3) 0.75	(3) GN / WH	(3) 4905	(3) I	(3) —	(3) Direct Fuel Injector High Voltage Supply Cylinder 5	(3) 3	(3) 0.75	(3) GN / WH	(3) 4905	(3) II	(3) —
(4) 4	(4) 0.75	(4) WH / YE	(4) 4907	(4) I	(4) —	(4) Direct Fuel Injector High Voltage Supply Cylinder 7	(4) 4	(4) 0.75	(4) WH / YE	(4) 4907	(4) II	(4) —
(5) 5	(5) 0.75	(5) BN	(5) 4801	(5) I	(5) —	(5) Direct Fuel Injector High Voltage Control Cylinder 1	(5) 5	(5) 0.75	(5) BN	(5) 4801	(5) II	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—
(7) 7	(7) 0.75	(7) GN	(7) 4803	(7) I	(7) —	(7) Direct Fuel Injector High Voltage Control Cylinder 3	(7) 7	(7) 0.75	(7) GN	(7) 4803	(7) II	(7) —
(8) 8	(8) 0.75	(8) WH / GN	(8) 4805	(8) I	(8) —	(8) Direct Fuel Injector High Voltage Control Cylinder 5	(8) 8	(8) 0.75	(8) WH / GN	(8) 4805	(8) II	(8) —
(9) 9	(9) 0.75	(9) YE / GY	(9) 4807	(9) I	(9) —	(9) Direct Fuel Injector High Voltage Control Cylinder 7	(9) 9	(9) 0.75	(9) YE / GY	(9) 4807	(9) II	(9) —
(10) 10	(10) 0.5	(10) WH / RD	(10) 480	(10) I	(10) —	(10) Engine Control Vehicle Sensors 5 Volt Reference 1	(10) 10	(10) 0.5	(10) BN / RD	(10) 480	(10) II	(10) —
(11) 11	(11) 0.5	(11) BU / WH	(11) 10786	(11) I	(11) —	(11) Fuel Rail Pressure Sensor SENT 1 Signal	(11) 11	(11) 0.5	(11) BU / WH	(11) 10786	(11) II	(11) —
(12) 12	(12) 0.5	(12) BK / YE	(12) 548	(12) I	(12) —	(12) Engine Control Sensors Low Reference 1	(12) 12	(12) 0.5	(12) BK / GN	(12) 548	(12) II	(12) —

X161 Engine Wiring Harness to Fuel Injector Wiring Harness - Right



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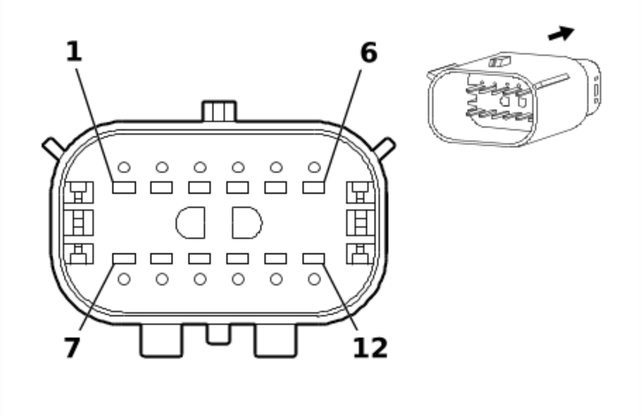


1825167

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 33472-1226
- Service Connector: 19352907
- Description: 12-Way F 1.5 MX Series, Sealed(BK)

Connector Part Information
- Harness Type: Fuel Injector Wiring Harness - Right
- OEM Connector: 334826211
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way M 1.5 MX Series, Sealed(BK)

Terminal Part Information

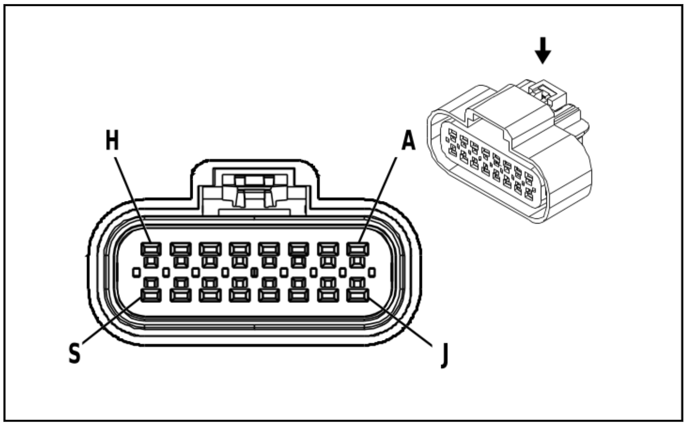
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85528055	J-35616-2A (GY)	J-38125-217
II	Not required	J-35616-3 (GY)	No Tool Required

X161 Engine Wiring Harness to Fuel Injector Wiring Harness - Right

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BU / GY	(1) 4902	(1) I	(1) —	(1) Direct Fuel Injector High Voltage Supply Cylinder 2	(1) 1	(1) 0.75	(1) BU / GY	(1) 4902	(1) II	(1) —
(2) 2	(2) 0.75	(2) BU / WH	(2) 4904	(2) I	(2) —	(2) Direct Fuel Injector High Voltage Supply Cylinder 4	(2) 2	(2) 0.75	(2) BU / WH	(2) 4904	(2) II	(2) —
(3) 3	(3) 0.75	(3) VT / GY	(3) 4906	(3) I	(3) —	(3) Direct Fuel Injector High Voltage Supply Cylinder 6	(3) 3	(3) 0.75	(3) VT / GY	(3) 4906	(3) II	(3) —
(4) 4	(4) 0.75	(4) GY / WH	(4) 4908	(4) I	(4) —	(4) Direct Fuel Injector High Voltage Supply Cylinder 8	(4) 4	(4) 0.75	(4) GY / WH	(4) 4908	(4) II	(4) —
(5) 5	(5) 0.75	(5) BU	(5) 4802	(5) I	(5) —	(5) Direct Fuel Injector High Voltage Control Cylinder 2	(5) 5	(5) 0.75	(5) BU	(5) 4802	(5) II	(5) —
6 - 7	—	—	—	—	—	Not Occupied	6 - 7	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(8) 8	(8) 0.75	(8) GY / BU	(8) 4804	(8) I	(8) —	(8) Direct Fuel Injector High Voltage Control Cylinder 4	(8) 8	(8) 0.75	(8) GY / BU	(8) 4804	(8) II	(8) —
(9) 9	(9) 0.75	(9) VT / GN	(9) 4806	(9) I	(9) —	(9) Direct Fuel Injector High Voltage Control Cylinder 6	(9) 9	(9) 0.75	(9) VT / GN	(9) 4806	(9) II	(9) —
(10) 10	(10) 0.75	(10) GY	(10) 4808	(10) I	(10) —	(10) Direct Fuel Injector High Voltage Control Cylinder 8	(10) 10	(10) 0.75	(10) GY	(10) 4808	(10) II	(10) —
(11) 11	(11) 0.75	(11) VT / BK	(11) 7300	(11) I	(11) —	(11) High Pressure Fuel Pump Low Control	(11) 11	(11) 0.75	(11) VT / BK	(11) 7300	(11) II	(11) —
(12) 12	(12) 0.75	(12) YE	(12) 7301	(12) I	(12) —	(12) High Pressure Fuel Pump High Control	(12) 12	(12) 0.75	(12) YE	(12) 7301	(12) II	(12) —

X175P Engine Wiring Harness to PTO Harness



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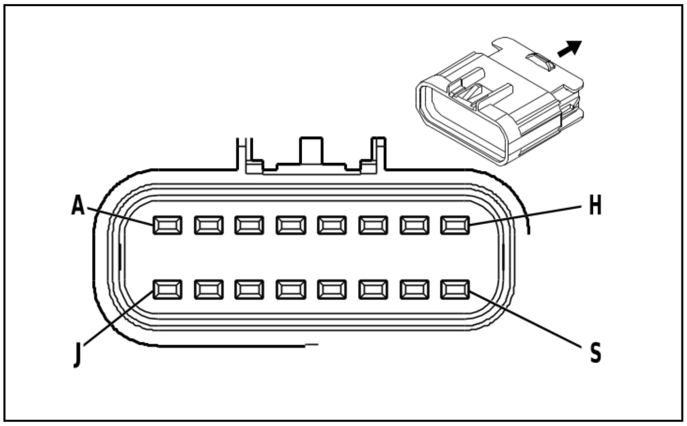


632345

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 15326863
- Service Connector: 19180282
- Description: 16-Way F 150 GT Series, Sealed(BK)

Connector Part Information
- Harness Type: PTO Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 16-Way M (BK)

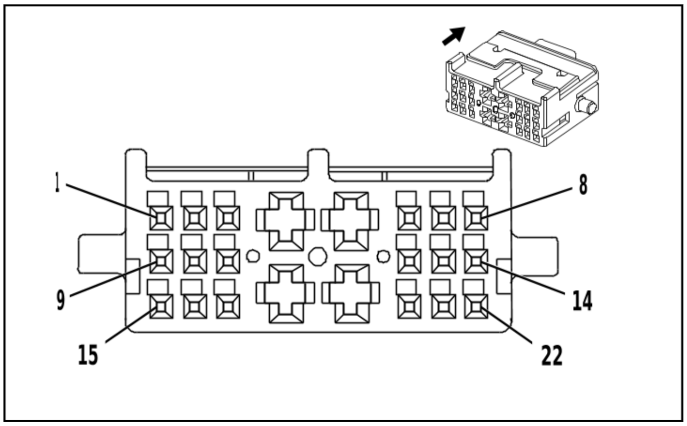
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19368215	J-35616-14 (GN)	J-38125-553
II	Not required	No Tool Required	No Tool Required

X175P Engine Wiring Harness to PTO Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
A	0.5	GY / GN	6239	I	—	Transmission Power Take-Off Engage/ Disengage Signal Power	A	0.5	GY / GN	6239	II	—
B - C	—	—	—	—	—	Not Occupied	B - C	—	—	—	—	—
D	1.5	BK	450	I	—	Ground	D	1.5	BK	450	II	—
E - F	—	—	—	—	—	Not Occupied	E - F	—	—	—	—	—
G	0.5	WH / BK	8238	I	—	Power Take Off Upfitter Interlock Switch Signal 2	G	0.5	WH / BK	8238	II	—
H	—	—	—	—	—	Not Occupied	H	—	—	—	—	—
J	0.5	WH / GN	6142	I	—	Power Take-Off Engine Shutdown Signal	J	0.5	WH / GN	6142	II	—
K	0.5	RD / VT	2640	I	—	Battery Positive Voltage	K	0.5	RD / VT	2640	II	—
L - M	—	—	—	—	—	Not Occupied	L - M	—	—	—	—	—
N	0.5	VT / GN	4308	I	—	Power Take-Off Remote Throttle Signal	N	0.5	VT / GN	4308	II	—
P	—	—	—	—	—	Not Occupied	P	—	—	—	—	—
R	0.5	VT / WH	239	I	—	Run/Crank Ignition 1 Voltage	R	0.5	VT / WH	239	II	—
S	—	—	—	—	—	Not Occupied	S	—	—	—	—	—

X176 Automatic Transmission Wiring Harness to Automatic Transmission Wiring Harness



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Connector Part Information
- Harness Type: Automatic Transmission Wiring Harness
- OEM Connector: 1897543-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 22-Way F 0.64 Micro-Quadlock, 2.8 Micro-Power Series(NA)

Connector Part Information
- Harness Type: atic Transmission Wiring Harness to atic Transmission Wiring Harness to Transmission Control
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 22-Way M (NA)

Terminal Part Information

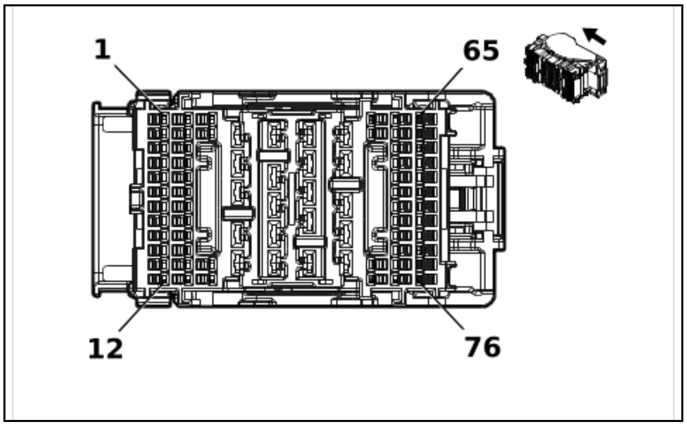
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required
II	Not required	J-35616-64B (L-BU)	No Tool Required
III	Not required	No Tool Required	No Tool Required

X176 Automatic Transmission Wiring Harness to Automatic Transmission Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT	(1) 7819	(1) II	(1) —	(1) Default Disable Solenoid Control	(1) 1	(1) 0.5	(1) VT	(1) 7819	(1) III	(1) —
(2) 2	(2) 0.5	(2) GN / OG	(2) 1530	(2) II	(2) —	(2) Transmission Line Pressure Control Solenoid Valve Control	(2) 2	(2) 0.5	(2) GN / OG	(2) 1530	(2) III	(2) —
(3) 3	(3) 0.5	(3) GY / BN	(3) 422	(3) II	(3) —	(3) Torque Converter Clutch Solenoid Valve Control	(3) 3	(3) 0.5	(3) GY / BN	(3) 422	(3) III	(3) —
(4) 4	(4) 0.5	(4) BN	(4) 6387	(4) I	(4) —	(4) Transmission High Side Driver 1 Control	(4) 4	(4) 0.5	(4) BN	(4) 6387	(4) III	(4) —
5 - 12	—	—	—	—	—	Not Occupied	5 - 12	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(13) 13	(13) 0.5	(13) BU / BN	(13) 586	(13) II	(13) —	(13) Transmission Fluid Temperature Sensor Low Reference	(13) 13	(13) 0.5	(13) BU / BN	(13) 586	(13) III	(13) —
(14) 14	(14) 0.5	(14) BN / YE	(14) 585	(14) II	(14) —	(14) Transmission Fluid Temperature Sensor Signal	(14) 14	(14) 0.5	(14) BN / YE	(14) 585	(14) III	(14) —
(15) 15	(15) 0.5	(15) BU / GN	(15) 6404	(15) II	(15) —	(15) Clutch Solenoid Valve E Control	(15) 15	(15) 0.5	(15) BU / GN	(15) 6404	(15) III	(15) —
(16) 16	(16) 0.5	(16) GN / BN	(16) 6403	(16) II	(16) —	(16) Clutch Solenoid Valve D Control	(16) 16	(16) 0.5	(16) GN / BN	(16) 6403	(16) III	(16) —
(17) 17	(17) 0.5	(17) GY	(17) 6402	(17) II	(17) —	(17) Clutch Solenoid Valve C Control	(17) 17	(17) 0.5	(17) GY	(17) 6402	(17) III	(17) —
(18) 18	(18) 0.5	(18) WH	(18) 6388	(18) I	(18) —	(18) Transmission High Side Driver 2 Control	(18) 18	(18) 0.5	(18) WH	(18) 6388	(18) III	(18) —
19	—	—	—	—	—	Not Occupied	19	—	—	—	—	—
(20) 20	(20) 0.5	(20) BN / WH	(20) 4509	(20) II	(20) —	(20) Transmission Clutch F Control	(20) 20	(20) 0.5	(20) BN / WH	(20) 4509	(20) III	(20) —
(21) 21	(21) 0.5	(21) YE / VT	(21) 4507	(21) II	(21) —	(21) Transmission Clutch H Control	(21) 21	(21) 0.5	(21) YE / VT	(21) 4507	(21) III	(21) —
(22) 22	(22) 0.5	(22) BU / GY	(22) 4508	(22) II	(22) —	(22) Transmission Clutch G Control	(22) 22	(22) 0.5	(22) BU / GY	(22) 4508	(22) III	(22) —

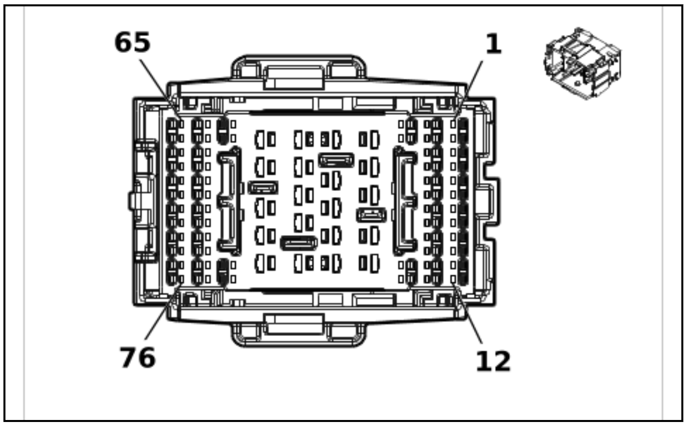
X210 Instrument Panel Wiring Harness to Body Wiring Harness



6171454

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6099-0188
- Service Connector: 85026856
- Description: 76-Way F 1.2 Sumitomo, 2.8 YESC Series(BK)



6171465

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 6099-0184
- Service Connector: 13549030
- Description: 76-Way M 1.2 Sumitomo, 2.8 YESC Series(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84962854	J-35616-12 (BU)	J-38125-215A
II	84962855	J-35616-4A (PU)	J-38125-11A
III	84616651	J-35616-13 (BU)	J-38125-215A
IV	84888592	J-35616-5 (PU)	J-38125-11A

X210 Instrument Panel Wiring Harness to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / GN	(1) 1540	(1) I	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 0.5	(1) RD / GN	(1) 1540	(1) III	(1) —
(2) 2	(2) 0.5	(2) RD / YE	(2) 6540	(2) I	(2) —	(2) Battery Positive Voltage	(2) 2	(2) 0.5	(2) RD / YE	(2) 6540	(2) III	(2) —
(3) 3	(3) 0.35	(3) BN / OG	(3) 3020	(3) I	(3) —	(3) Steering Wheel Air Bag Stage 1 Low Control	(3) 3	(3) 0.35	(3) BN / OG	(3) 3020	(3) III	(3) —
(4) 4	(4) 0.35	(4) OG / VT	(4) 3021	(4) I	(4) —	(4) Steering Wheel Air Bag Stage 1 High Control	(4) 4	(4) 0.35	(4) OG / VT	(4) 3021	(4) III	(4) —
(5) 5	(5) 0.35	(5) WH / OG	(5) 3022	(5) I	(5) —	(5) Steering Wheel Air Bag Stage 2 Low Control	(5) 5	(5) 0.35	(5) WH / OG	(5) 3022	(5) III	(5) —
(6) 6	(6) 0.35	(6) OG / GN	(6) 3023	(6) I	(6) —	(6) Steering Wheel Air Bag Stage 2 High Control	(6) 6	(6) 0.35	(6) OG / GN	(6) 3023	(6) III	(6) —
(7) 7	(7) 0.35	(7) BN / BU	(7) 4892	(7) I	(7) —	(7) Auxiliary Battery Relay Control	(7) 7	(7) 0.35	(7) BN / BU	(7) 4892	(7) III	(7) —
(8) 8	(8) —	(8) —	(8) —	(8) —	(8) —	(8) —	(8) 8	(8) 0.35	(8) YE / WH	(8) 900	(8) III	(8) —
(9) 9	(9) —	(9) —	(9) —	(9) —	(9) —	(9) —	(9) 9	(9) 0.35	(9) YE / BK	(9) 901	(9) III	(9) —
(10) 10	(10) —	(10) —	(10) —	(10) —	(10) —	(10) —	(10) 10	(10) 0.35	(10) YE / BU	(10) 902	(10) III	(10) —
11 - 12	—	—	—	—	—	Not Occupied	11 - 12	—	—	—	—	—
(13) 13	(13) 0.35	(13) BN / BK	(13) 3552	(13) I	(13) —	(13) Interior Passive Entry Antenna 1 High Signal	(13) 13	(13) 0.35	(13) BN / BK	(13) 3552	(13) III	(13) —
(14) 14	(14) 0.35	(14) WH	(14) 3553	(14) I	(14) —	(14) Interior Passive Entry Antenna 1 Low Signal	(14) 14	(14) 0.35	(14) WH	(14) 3553	(14) III	(14) —
(15) 15	(15) 0.35	(15) WH	(15) 4100	(15) I	(15) —	(15) AUTOSAR CAN Bus [-] 4 Serial Data	(15) 15	(15) 0.5	(15) WH	(15) 4100	(15) III	(15) —

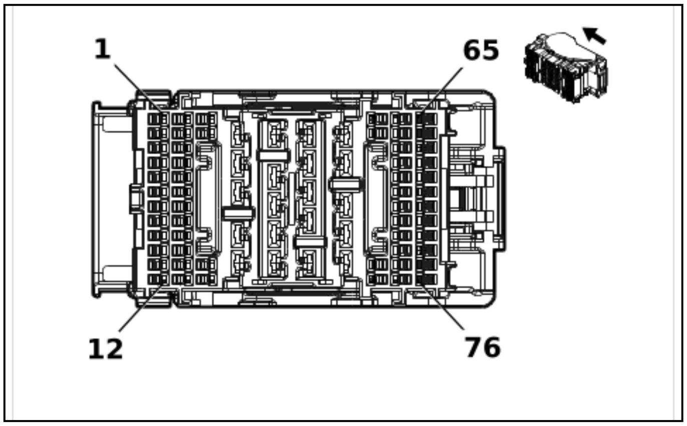
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(16) 16	(16) 0.35	(16) BU / VT	(16) 4101	(16) I	(16) —	(16) AUTOSAR CAN Bus [+] 4 Serial Data	(16) 16	(16) 0.5	(16) BU / VT	(16) 4101	(16) III	(16) —
(17) 17	(17) 0.35	(17) WH	(17) 4976	(17) I	(17) —	(17) AUTOSAR CAN Bus [-] 3 Serial Data	(17) 17	(17) 0.5	(17) WH	(17) 4976	(17) III	(17) —
(18) 18	(18) 0.35	(18) BU / BK	(18) 4977	(18) I	(18) —	(18) AUTOSAR CAN Bus [+] 3 Serial Data	(18) 18	(18) 0.5	(18) BU / BK	(18) 4977	(18) III	(18) —
(19) 19	(19) 0.5	(19) RD / GN	(19) 7740	(19) I	(19) —	(19) Battery Positive Voltage	(19) 19	(19) 0.5	(19) RD / GN	(19) 7740	(19) III	(19) —
20	—	—	—	—	—	Not Occupied	20	—	—	—	—	—
(21) 21	(21) 0.35	(21) BU / YE	(21) 4984	(21) I	(21) —	(21) AUTOSAR CAN Bus [-] 5 Serial Data	(21) 21	(21) 0.5	(21) BU / YE	(21) 4984	(21) III	(21) —
(22) 22	(22) 0.35	(22) BU / WH	(22) 4985	(22) I	(22) —	(22) AUTOSAR CAN Bus [+] 5 Serial Data	(22) 22	(22) 0.5	(22) BU / WH	(22) 4985	(22) III	(22) —
(23) 23	(23) 0.35	(23) WH	(23) 4986	(23) I	(23) —	(23) AUTOSAR CAN Bus [-] 1 Serial Data	(23) 23	(23) 0.5	(23) WH	(23) 4986	(23) III	(23) —
(24) 24	(24) 0.35	(24) BU	(24) 4987	(24) I	(24) —	(24) AUTOSAR CAN Bus [+] 1 Serial Data	(24) 24	(24) 0.5	(24) BU	(24) 4987	(24) III	(24) —
25 - 26	—	—	—	—	—	Not Occupied	25 - 26	—	—	—	—	—
(27) 27	(27) 0.35	(27) BN / BK	(27) 4996	(27) I	(27) —	(27) Immobilizer Antenna Signal [+]	(27) 27	(27) 0.35	(27) BN / BK	(27) 4996	(27) III	(27) —
(28) 28	(28) 0.35	(28) WH / GY	(28) 4997	(28) I	(28) —	(28) Immobilizer Antenna Low Signal	(28) 28	(28) 0.35	(28) WH / GY	(28) 4997	(28) III	(28) —
(29) 29	(29) 2.5	(29) RD / BN	(29) 4142	(29) II	(29) —	(29) Primary Fused Battery Positive Voltage	(29) 29	(29) 2.5	(29) RD / BN	(29) 4142	(29) IV	(29) —
(30) 30	(30) 0.35	(30) GY	(30) 1715	(30) II	(30) —	(30) Windshield Wiper Switch High Signal	(30) 30	(30) 0.35	(30) GY	(30) 1715	(30) IV	(30) —
(31) 31	(31) 0.5	(31) GN / YE	(31) 2731	(31) II	(31) —	(31) Brake System Control Module LIN Bus 1	(31) 31	(31) 0.5	(31) GN / YE	(31) 2731	(31) IV	(31) —
(32) 32	(32) 0.35 (32) 0.5	(32) BU (32) BU	(32) 4987 (32) 4987	(32) II (32) II	(32) — (32) —	(32) AUTOSAR CAN Bus [+] 1 Serial Data (32) AUTOSAR CAN Bus [+] 1 Serial Data	(32) 32	(32) 0.5	(32) BU	(32) 4987	(32) IV	(32) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(33) 33	(33) 0.35 (33) 0.5	(33) WH (33) WH	(33) 4986 (33) 4986	(33) II (33) II	(33) — (33) —	(33) AUTOSAR CAN Bus [-] 1 Serial Data (33) AUTOSAR CAN Bus [-] 1 Serial Data	(33) 33	(33) 0.5	(33) WH	(33) 4986	(33) IV	(33) —
34	—	—	—	—	—	Not Occupied	34	—	—	—	—	—
(35) 35	(35) 0.75	(35) GN / BK	(35) 116	(35) II	(35) —	(35) Left Rear Speaker [-] Control	(35) 35	(35) 0.75	(35) GN / BK	(35) 116	(35) IV	(35) —
(36) 36	(36) 0.75	(36) GN	(36) 199	(36) II	(36) —	(36) Left Rear Speaker [+] Control	(36) 36	(36) 0.75	(36) GN	(36) 199	(36) IV	(36) —
(37) 37	(37) 0.75	(37) BN / BU	(37) 118	(37) II	(37) —	(37) Left Front Speaker [-] Control 1	(37) 37	(37) 0.75	(37) BN / BU	(37) 118	(37) IV	(37) —
(38) 38	(38) 0.75	(38) BU	(38) 201	(38) II	(38) —	(38) Left Front Speaker 1 [+] Control	(38) 38	(38) 0.75	(38) BU	(38) 201	(38) IV	(38) —
39	—	—	—	—	—	Not Occupied	39	—	—	—	—	—
(40) 40	(40) 0.35	(40) BU / WH	(40) 3119	(40) II	(40) —	(40) Roof Rail Air Bag Disable Switch Signal	(40) 40	(40) 0.35	(40) BU / WH	(40) 3119	(40) IV	(40) —
(41) 41	(41) 0.35	(41) BN / WH	(41) 3895	(41) II	(41) —	(41) Roof Rail Air Bag Disable Switch Low Reference	(41) 41	(41) 0.35	(41) BN / WH	(41) 3895	(41) IV	(41) —
42 - 44	—	—	—	—	—	Not Occupied	42 - 44	—	—	—	—	—
(45) 45	(45) 0.35	(45) GN / VT	(45) 4786	(45) II	(45) —	(45) Dome/ Reading Lamp Enable Signal	(45) 45	(45) 0.5	(45) GN / VT	(45) 4786	(45) IV	(45) —
(46) 46	(46) 0.35	(46) GN / BN	(46) 507	(46) II	(46) —	(46) Wait To Start Indicator Control	(46) 46	(46) 0.35	(46) GN / BN	(46) 507	(46) IV	(46) —
47	—	—	—	—	—	Not Occupied	47	—	—	—	—	—
(48) 48	(48) 0.5	(48) YE / VT	(48) 6191	(48) II	(48) —	(48) Power Rear Window Switch Open Signal	(48) 48	(48) 0.5	(48) YE / VT	(48) 6191	(48) IV	(48) —
(49) 49	(49) 0.5	(49) WH	(49) 6192	(49) I	(49) —	(49) Sliding Rear Window Switch Close Signal	(49) 49	(49) 0.5	(49) WH	(49) 6192	(49) III	(49) —
(50) 50	(50) 0.5	(50) YE	(50) 6817	(50) I	(50) —	(50) LED Backlight Dimming Control 1	(50) 50	(50) 0.5	(50) YE	(50) 6817	(50) III	(50) —
(51) 51	(51) 0.35	(51) WH / GY	(51) 7297	(51) I	(51) —	(51) Minor Endgate High Relay Control	(51) 51	(51) 0.75	(51) WH / GY	(51) 7297	(51) III	(51) —
52	—	—	—	—	—	Not Occupied	52	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(53) 53	(53) 0.5	(53) RD / VT	(53) 7140	(53) I	(53) —	(53) Battery Positive Voltage	(53) 53	(53) 0.5	(53) RD / VT	(53) 7140	(53) III	(53) —
(54) 54	(54) 0.35	(54) WH / GN	(54) 7728	(54) I	(54) —	(54) Major Endgate High Relay Control	(54) 54	(54) 0.75	(54) WH / GN	(54) 7728	(54) III	(54) —
(55) 55	(55) 0.35	(55) BU / VT	(55) 7729	(55) I	(55) —	(55) Major Endgate Low Relay Control	(55) 55	(55) 0.75	(55) BU / VT	(55) 7729	(55) III	(55) —
(56) 56	(56) 0.5	(56) VT	(56) 801	(56) I	(56) —	(56) Retained Accessory Power Control	(56) 56	(56) 0.35	(56) VT	(56) 801	(56) III	(56) —
(57) 57	(57) 0.5	(57) BN / YE	(57) 820	(57) I	(57) —	(57) Center High Mounted Stop Lamp Supply Voltage (57) Center High Mounted Stop Lamp Supply Voltage	(57) 57	(57) 0.35 (57) 0.5	(57) BN / YE (57) BN / YE	(57) 820 (57) 820	(57) III (57) III	(57) — (57) —
(58) 58	(58) 0.35	(58) GN / BU	(58) 2733	(58) I	(58) —	(58) Brake System Control Module LIN Bus 2	(58) 58	(58) 0.5	(58) GN / BU	(58) 2733	(58) III	(58) —
(59) 59	(59) 0.5	(59) RD / VT	(59) 2640	(59) I	(59) —	(59) Battery Positive Voltage	(59) 59	(59) 0.5	(59) RD / VT	(59) 2640	(59) III	(59) —
(60) 60	(60) 0.35	(60) BU / YE	(60) 4984	(60) I	(60) —	(60) AUTOSAR CAN Bus [-] 5 Serial Data	(60) 60	(60) 0.5	(60) BU / YE	(60) 4984	(60) III	(60) —
(61) 61	(61) 0.35	(61) BU / WH	(61) 4985	(61) I	(61) —	(61) AUTOSAR CAN Bus [+] 5 Serial Data	(61) 61	(61) 0.5	(61) BU / WH	(61) 4985	(61) III	(61) —
(62) 62	(62) 0.35	(62) YE	(62) 10280	(62) I	(62) —	(62) Private Steering Angle CAN Bus [+] Serial Data	(62) 62	(62) 0.35	(62) YE	(62) 10280	(62) III	(62) —
(63) 63	(63) 0.35	(63) BU / WH	(63) 10279	(63) I	(63) —	(63) Private Steering Angle CAN Bus [-] Serial Data	(63) 63	(63) 0.35	(63) BU / WH	(63) 10279	(63) III	(63) —
(64) 64	(64) 0.35	(64) GN / BN	(64) 2087	(64) I	(64) —	(64) Multi-axis Acceleration Sensor Supply Voltage	(64) 64	(64) 0.35	(64) GN / BN	(64) 2087	(64) III	(64) —
(65) 65	(65) 0.35	(65) GN / GY	(65) 817	(65) I	(65) —	(65) Vehicle Speed Signal	(65) 65	(65) 0.35	(65) GN / GY	(65) 817	(65) III	(65) —
(66) 66	(66) 0.35	(66) WH / GY	(66) 2935	(66) I	(66) —	(66) Task Lamp Switch Signal	(66) 66	(66) 0.35	(66) WH / GY	(66) 2935	(66) III	(66) —
(67) 67	(67) 0.5	(67) RD / YE	(67) 2340	(67) I	(67) —	(67) Battery Positive Voltage	(67) 67	(67) 0.5	(67) RD / YE	(67) 2340	(67) III	(67) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(68) 68	(68) 0.5	(68) WH / VT	(68) 1430	(68) I	(68) —	(68) Exterior Courtesy Lamp Control	(68) 68	(68) 0.5	(68) WH / VT	(68) 1430	(68) III	(68) —
(69) 69	(69) 0.5	(69) GN / WH	(69) 2854	(69) I	(69) —	(69) Body Control Module LIN Bus 8	(69) 69	(69) 0.35	(69) GN / WH	(69) 2854	(69) III	(69) —
(70) 70	(70) 0.5	(70) BU / BN	(70) 6807	(70) I	(70) —	(70) DC/AC Inverter Control	(70) 70	(70) 0.5	(70) BU / BN	(70) 6807	(70) III	(70) —
(71) 71	(71) 0.5	(71) VT / RD	(71) 4049	(71) I	(71) —	(71) AC Power Outlet Sensor High Reference	(71) 71	(71) 0.5	(71) VT / RD	(71) 4049	(71) III	(71) —
72	—	—	—	—	—	Not Occupied	72	—	—	—	—	—
(73) 73	(73) 0.5	(73) BN / GN	(73) 4246	(73) I	(73) —	(73) Identification Lamp Control	(73) 73	(73) 0.5	(73) BN / GN	(73) 4246	(73) III	(73) —
(74) 74	(74) 0.35	(74) WH	(74) 10116	(74) I	(74) —	(74) AC Outlet Low Reference	(74) 74	(74) 0.35	(74) BARE	(74) 10116	(74) III	(74) —
(75) 75	(75) 0.75	(75) BK	(75) 10117	(75) I	(75) —	(75) AC Outlet Phase A Control	(75) 75	(75) 0.75	(75) BK	(75) 10117	(75) III	(75) —
(76) 76	(76) 0.75	(76) RD	(76) 10118	(76) I	(76) —	(76) AC Outlet Phase B Control	(76) 76	(76) 0.75	(76) RD	(76) 10118	(76) III	(76) —

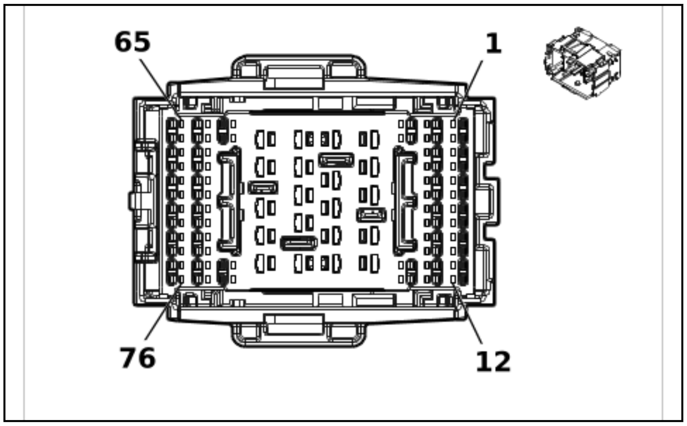
X211 Instrument Panel Wiring Harness to Body Wiring Harness



6171454

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6099-0188
- Service Connector: 85026856
- Description: 76-Way F 1.2 Sumitomo, 2.8 YESC Series(BK)



6171465

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 6099-0184
- Service Connector: 13549030
- Description: 76-Way M 1.2 Sumitomo, 2.8 YESC Series(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84962854	J-35616-12 (BU)	J-38125-215A
II	84962855	J-35616-4A (PU)	J-38125-11A
III	84616651	J-35616-13 (BU)	J-38125-215A
IV	84888592	J-35616-5 (PU)	J-38125-11A

X211 Instrument Panel Wiring Harness to Body Wiring Harness

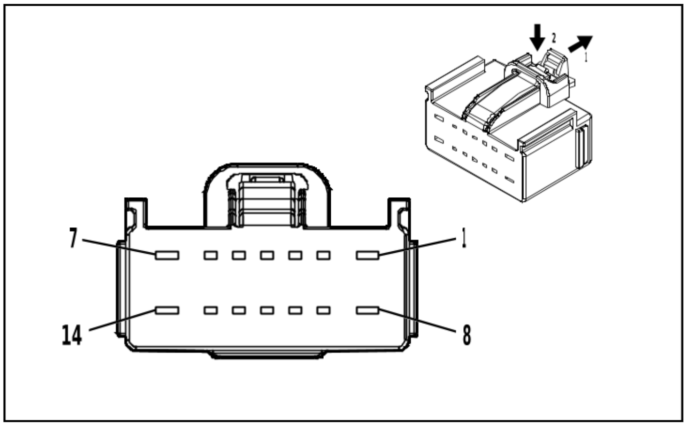
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BK	(1) 339	(1) I	(1) —	(1) Run/Crank Ignition 1 Voltage	(1) 1	(1) 0.5	(1) VT / BK	(1) 339	(1) III	(1) —
(2) 2	(2) 0.35	(2) BU / VT	(2) 807	(2) I	(2) —	(2) Ignition Off/Accessory Ignition Voltage	(2) 2	(2) 0.35	(2) BU / VT	(2) 807	(2) III	(2) —
3	—	—	—	—	—	Not Occupied	3	—	—	—	—	—
(4) 4	(4) 0.5	(4) GN / WH	(4) 24	(4) I	(4) —	(4) Backup Lamp Control	(4) 4	(4) 0.5	(4) GN / WH	(4) 24	(4) III	(4) —
(5) 5	(5) 0.35	(5) OG / WH	(5) 3024	(5) I	(5) —	(5) Passenger Instrument Panel Air Bag Stage 1 Low Control	(5) 5	(5) 0.35	(5) OG / WH	(5) 3024	(5) III	(5) —
(6) 6	(6) 0.35	(6) YE / OG	(6) 3025	(6) I	(6) —	(6) Passenger Instrument Panel Air Bag Stage 1 High Control	(6) 6	(6) 0.35	(6) YE / OG	(6) 3025	(6) III	(6) —
(7) 7	(7) 0.35	(7) OG / VT	(7) 3026	(7) I	(7) —	(7) Passenger Instrument Panel Air Bag Stage 2 Low Control	(7) 7	(7) 0.35	(7) OG / VT	(7) 3026	(7) III	(7) —
(8) 8	(8) 0.35	(8) GY / OG	(8) 3027	(8) I	(8) —	(8) Passenger Instrument Panel Air Bag Stage 2 High Control	(8) 8	(8) 0.35	(8) GY / OG	(8) 3027	(8) III	(8) —
9	—	—	—	—	—	Not Occupied	9	—	—	—	—	—
(10) 10	(10) 0.35	(10) YE	(10) 7115	(10) I	(10) —	(10) Rear Axle Differential Lock Indicator Control	(10) 10	(10) 0.35	(10) YE	(10) 7115	(10) III	(10) —
(11) 11	(11) 0.35	(11) YE / GN	(11) 7122	(11) I	(11) —	(11) Axle Differential Lock Switch Signal	(11) 11	(11) 0.35	(11) YE / GN	(11) 7122	(11) III	(11) —
12 - 15	—	—	—	—	—	Not Occupied	12 - 15	—	—	—	—	—
(16) 16	(16) 0.35	(16) GN / BN	(16) 3005	(16) I	(16) —	(16) Active Noise Cancellation Microphone 1 Signal	(16) 16	(16) 0.35	(16) GN / BN	(16) 3005	(16) III	(16) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(17) 17	(17) 0.35	(17) GN / BK	(17) 3008	(17) I	(17) —	(17) Active Noise Cancellation Microphone 1 Feedback Signal	(17) 17	(17) 0.35	(17) GN / BK	(17) 3008	(17) III	(17) —
18 - 24	—	—	—	—	—	Not Occupied	18 - 24	—	—	—	—	—
(25) 25	(25) 0.35	(25) BU	(25) 4987	(25) I	(25) —	(25) AUTOSAR CAN Bus [+] 1 Serial Data	(25) 25	(25) 0.5	(25) BU	(25) 4987	(25) III	(25) —
(26) 26	(26) 0.35	(26) WH	(26) 4986	(26) I	(26) —	(26) AUTOSAR CAN Bus [-] 1 Serial Data	(26) 26	(26) 0.5	(26) WH	(26) 4986	(26) III	(26) —
27 - 28	—	—	—	—	—	Not Occupied	27 - 28	—	—	—	—	—
(29) 29	(29) 1	(29) GN / YE	(29) 6840	(29) II	(29) —	(29) Auxiliary Device 2 Switched Voltage	(29) 29	(29) 1	(29) GN / YE	(29) 6840	(29) IV	(29) —
30 - 31	—	—	—	—	—	Not Occupied	30 - 31	—	—	—	—	—
(32) 32	(32) 0.5	(32) BU / BK	(32) 1053	(32) II	(32) —	(32) Center High Mounted Stop Lamp Control 3	(32) 32	(32) 0.5	(32) BU / BK	(32) 1053	(32) IV	(32) —
(33) 33	(33) 0.75	(33) WH	(33) 46	(33) II	(33) —	(33) Right Rear Speaker [+] Control	(33) 33	(33) 0.75	(33) WH	(33) 46	(33) IV	(33) —
(34) 34	(34) 0.75	(34) BU / BK	(34) 115	(34) II	(34) —	(34) Right Rear Speaker [-] Control	(34) 34	(34) 0.75	(34) BU / BK	(34) 115	(34) IV	(34) —
(35) 35	(35) 0.75	(35) YE / BK	(35) 117	(35) II	(35) —	(35) Right Front Speaker [-] Control 1	(35) 35	(35) 0.75	(35) YE / BK	(35) 117	(35) IV	(35) —
(36) 36	(36) 0.75	(36) YE	(36) 200	(36) II	(36) —	(36) Right Front Speaker 1 [+] Control	(36) 36	(36) 0.75	(36) YE	(36) 200	(36) IV	(36) —
(37) 37	(37) 0.75	(37) YE / BK	(37) 117	(37) II	(37) —	(37) Right Front Speaker [-] Control 1	(37) 37	(37) 0.75	(37) YE / BK	(37) 117	(37) IV	(37) —
(38) 38	(38) 0.75	(38) YE	(38) 200	(38) II	(38) —	(38) Right Front Speaker 1 [+] Control	(38) 38	(38) 0.75	(38) YE	(38) 200	(38) IV	(38) —
(39) 39	(39) 0.75	(39) YE / BK	(39) 117	(39) II	(39) —	(39) Right Front Speaker [-] Control 1	(39) 39	(39) 0.75	(39) YE / BK	(39) 117	(39) IV	(39) —
(40) 40	(40) 0.75	(40) YE	(40) 200	(40) II	(40) —	(40) Right Front Speaker 1 [+] Control	(40) 40	(40) 0.75	(40) YE	(40) 200	(40) IV	(40) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(41) 41	(41) 0.75	(41) WH / YE	(41) 1853	(41) II	(41) —	(41) Right Front Midrange Speaker [+] Control	(41) 41	(41) 0.75	(41) WH / YE	(41) 1853	(41) IV	(41) —
(42) 42	(42) 0.75	(42) BN / BK	(42) 1953	(42) II	(42) —	(42) Right Front Midrange Speaker [-] Control	(42) 42	(42) 0.75	(42) BN / BK	(42) 1953	(42) IV	(42) —
(43) 43	(43) 0.75	(43) YE / WH	(43) 1860	(43) II	(43) —	(43) Front Center Speaker [+] Control	(43) 43	(43) 0.75	(43) YE / WH	(43) 1860	(43) IV	(43) —
(44) 44	(44) 0.75	(44) BU / YE	(44) 1960	(44) II	(44) —	(44) Front Center Speaker [-] Control	(44) 44	(44) 0.75	(44) BU / YE	(44) 1960	(44) IV	(44) —
(45) 45	(45) 0.75	(45) BU / VT	(45) 1857	(45) II	(45) —	(45) Left Front Midrange Speaker [+] Control	(45) 45	(45) 0.75	(45) BU / VT	(45) 1857	(45) IV	(45) —
(46) 46	(46) 0.75	(46) BU / BN	(46) 1957	(46) II	(46) —	(46) Left Front Midrange Speaker [-] Control	(46) 46	(46) 0.75	(46) BU / BN	(46) 1957	(46) IV	(46) —
(47) 47	(47) 2	(47) BU	(47) 47	(47) II	(47) —	(47) Trailer Auxiliary Control	(47) 47	(47) 2	(47) BU	(47) 47	(47) IV	(47) —
(48) 48	(48) 2.5	(48) BK / WH	(48) 1051	(48) II	(48) —	(48) Signal Ground (48) Signal Ground	(48) 48	(48) 0.5 (48) 2.5	(48) BK / WH (48) BK / WH	(48) 1051 (48) 1051	(48) IV (48) IV	(48) — (48) —
(49) 49	(49) 0.35	(49) GN / WH	(49) 488	(49) I	(49) —	(49) Power Take-Off Control Switch Signal	(49) 49	(49) 0.5	(49) GN / WH	(49) 488	(49) III	(49) —
(50) 50	(50) 0.35	(50) BN / GN	(50) 4311	(50) I	(50) —	(50) Power Take-Off Enable Cabin Switch Normally Closed Signal	(50) 50	(50) 0.5	(50) BN / GN	(50) 4311	(50) III	(50) —
(51) 51	(51) 0.35 (51) 0.5	(51) BU / YE (51) BU / YE	(51) 4979 (51) 4979	(51) I (51) I	(51) — (51) —	(51) AUTOSAR CAN Bus [+] 2 Serial Data (51) AUTOSAR CAN Bus [+] 2 Serial Data	(51) 51	(51) 0.5	(51) BU / YE	(51) 4979	(51) III	(51) —
(52) 52	(52) 0.35 (52) 0.5	(52) WH (52) WH	(52) 4978 (52) 4978	(52) I (52) I	(52) — (52) —	(52) AUTOSAR CAN Bus [-] 2 Serial Data (52) AUTOSAR CAN Bus [-] 2 Serial Data	(52) 52	(52) 0.5	(52) WH	(52) 4978	(52) III	(52) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
53	—	—	—	—	—	Not Occupied	53	—	—	—	—	—
(54) 54	(54) 0.5	(54) GN / VT	(54) 5199	(54) I	(54) —	(54) Run/ Crank Relay Coil Control	(54) 54	(54) 0.5	(54) GN / VT	(54) 5199	(54) III	(54) —
55 - 59	—	—	—	—	—	Not Occupied	55 - 59	—	—	—	—	—
(60) 60	(60) 0.35	(60) YE / WH	(60) 1690	(60) I	(60) —	(60) Mirror Dimming Signal	(60) 60	(60) 0.35	(60) YE / WH	(60) 1690	(60) III	(60) —
(61) 61	(61) 0.35	(61) BK / YE	(61) 1691	(61) I	(61) —	(61) Automatic Day/Night Mirror Low Reference	(61) 61	(61) 0.35	(61) BK / YE	(61) 1691	(61) III	(61) —
62 - 76	—	—	—	—	—	Not Occupied	62 - 76	—	—	—	—	—

X213 Auxiliary Fuse Block Wiring Harness to Instrument Panel Wiring Harness



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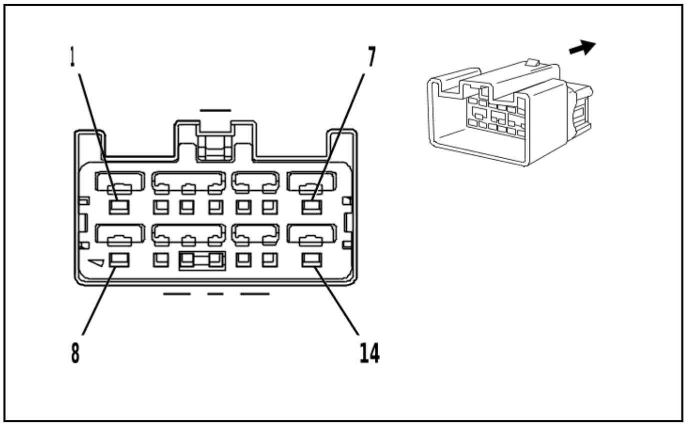


1283905

Connector Part Information
- Harness Type: Auxiliary Fuse Block Wiring Harness
- OEM Connector: 7289-7630-40
- Service Connector: Service by Harness - See Part Catalog
- Description: 14-Way F 1.5, 2.8 YESC Series(GY)

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 7282-6447-40
- Service Connector: 88956523
- Description: 14-Way M 1.5, 2.8 YESC Series(L-GY)

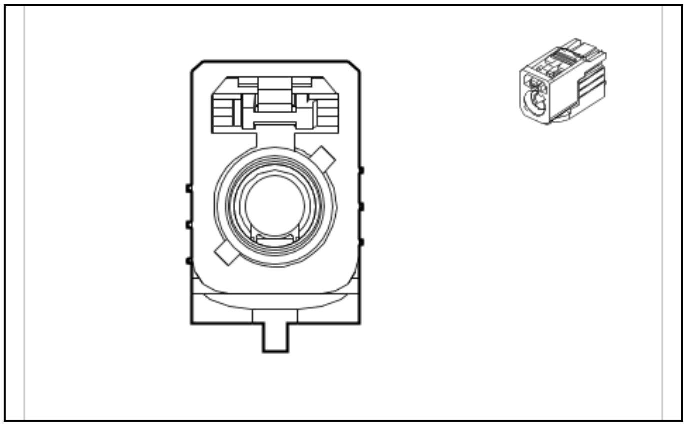
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required
III	13578908	J-35616-5 (PU)	J-38125-11A
IV	85544421	J-35616-3 (GY)	J-38125-215A

X213 Auxiliary Fuse Block Wiring Harness to Instrument Panel Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 1050	(1) II	(1) —	(1) Ground	(1) 1	(1) 2.5	(1) BK	(1) 1050	(1) III	(1) —
2	—	—	—	—	—	Not Occupied	2	—	—	—	—	—
(3) 3	(3) 0.35	(3) YE	(3) 6817	(3) I	(3) —	(3) LED Backlight Dimming Control 1	(3) 3	(3) 0.35	(3) YE	(3) 6817	(3) IV	(3) —
4	—	—	—	—	—	Not Occupied	4	—	—	—	—	—
(5) 5	(5) 0.5	(5) WH / BU	(5) 3691	(5) I	(5) —	(5) Trailer Brake Apply Signal	(5) 5	(5) 0.35	(5) WH / BU	(5) 3691	(5) IV	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—
(7) 7	(7) 2.5	(7) RD / BN	(7) 4142	(7) II	(7) —	(7) Primary Fused Battery Positive Voltage	(7) 7	(7) 2.5	(7) RD / BN	(7) 4142	(7) III	(7) —
(8) 8	(8) 2.5	(8) VT / BU	(8) 10735	(8) II	(8) —	(8) Upfitter Accessory 5 Supply Voltage	(8) 8	(8) 2.5	(8) VT / BU	(8) 10735	(8) III	(8) —
(9) 9	(9) —	(9) —	(9) —	(9) —	(9) —	(9) Out of Park Signal	(9) 9	(9) 0.35	(9) YE	(9) 6812	(9) IV	(9) —
(10) 10	(10) —	(10) —	(10) —	(10) —	(10) —	(10) Vehicle Speed Signal	(10) 10	(10) 0.35	(10) GN / GY	(10) 817	(10) IV	(10) —
(11) 11	(11) 0.35	(11) WH	(11) 6816	(11) I	(11) —	(11) Indicator Dimming Control	(11) 11	(11) 0.35	(11) WH	(11) 6816	(11) IV	(11) —
12	—	—	—	—	—	Not Occupied	12	—	—	—	—	—
(13) 13	(13) 0.5	(13) VT / BK	(13) 339	(13) I	(13) —	(13) Run/Crank Ignition 1 Voltage	(13) 13	(13) 0.5	(13) VT / BK	(13) 339	(13) IV	(13) —
(14) 14	(14) 2	(14) BU	(14) 47	(14) II	(14) —	(14) Trailer Auxiliary Control	(14) 14	(14) 2	(14) BU	(14) 47	(14) III	(14) —

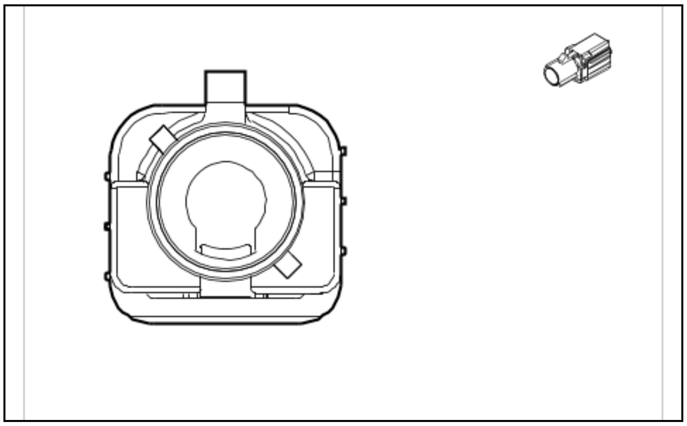
X217 Body Wiring Harness to Instrument Panel Wiring Harness



6267120

Connector Part Information

- Harness Type: Body Wiring Harness COAX
- OEM Connector: 33351013
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BU)



5873701

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness COAX
- OEM Connector: 33351038
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way M Coax Type(BU)

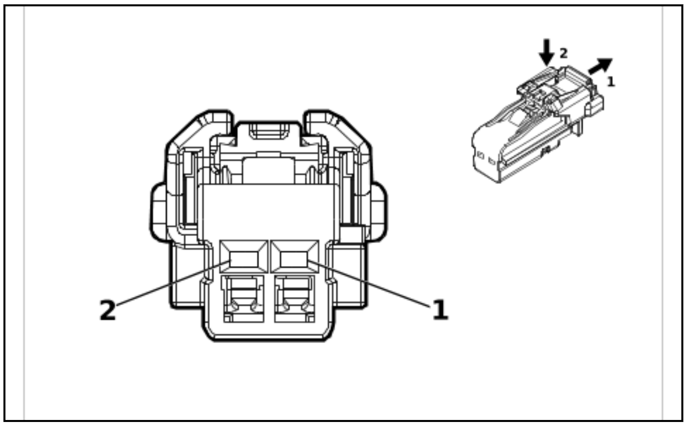
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X217 Body Wiring Harness to Instrument Panel Wiring Harness

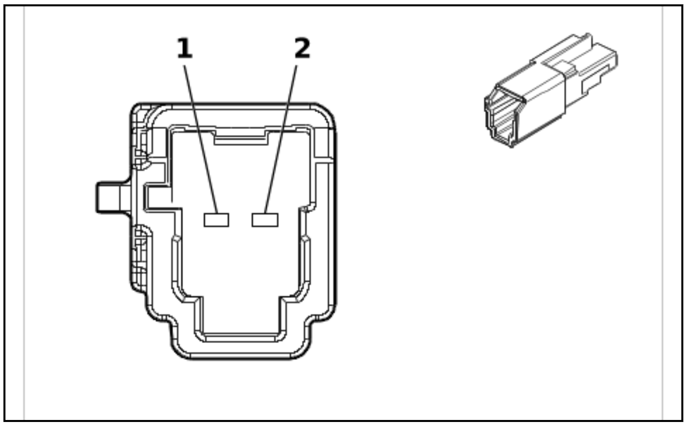
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
—	—	Coax Cable	—	I	—	Video Processing Module Coaxial Video Signal	—	—	Coax Cable	—	I	—

X218 Instrument Panel Wiring Harness to Body Wiring Harness (IOK)



4115691

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: 87816612
- Description: 2-Way F 1.2 MCON Series(BK)



6529124

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 6099-0610
- Service Connector: 85725003
- Description: 2-Way M 1.2 MBS Series(BK)

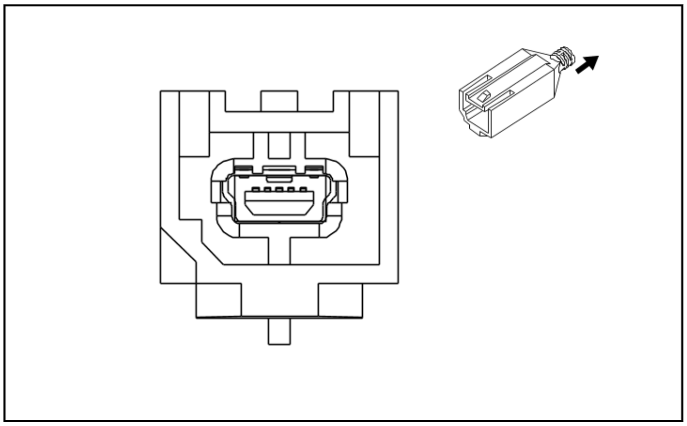
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Service by Cable	J-35616-12 (BU)	EL-38215-215A
II	Service by Cable	J-35616-13 (BU)	EL-38215-215A

X218 Instrument Panel Wiring Harness to Body Wiring Harness (IOK)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GN	(1) 7214	(1) I	(1) —	(1) Ethernet Bus 6 [-]	(1) 1	(1) 0.35	(1) GN	(1) 7214	(1) II	(1) —
(2) 2	(2) 0.35	(2) YE	(2) 7215	(2) I	(2) —	(2) Ethernet Bus 6 [+]	(2) 2	(2) 0.35	(2) YE	(2) 7215	(2) II	(2) —

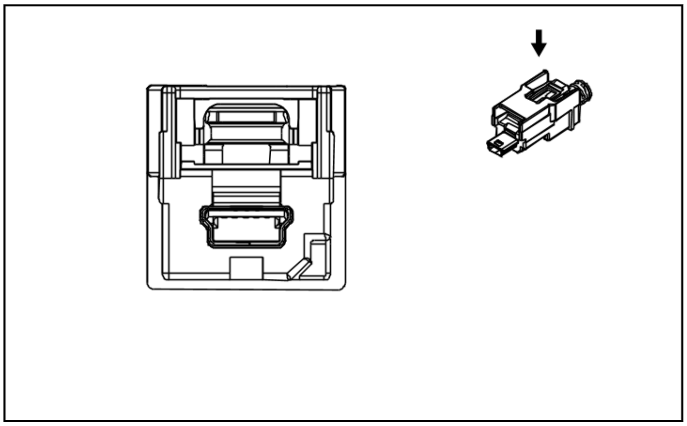
X226 Front Floor Console Wiring Harness to Instrument Panel Wiring Harness



3273655

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 13699757
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 5-Way F 2.0 Mini-B USB Type(BK)



2807425

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 13576672
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 5-Way M 2.0 Mini-B USB Type(BK)

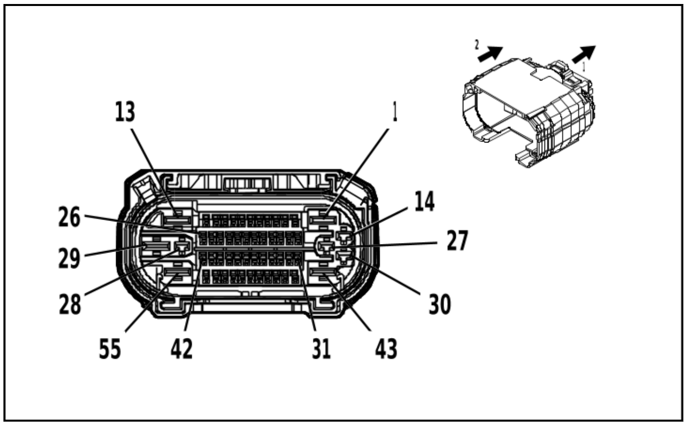
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X226 Front Floor Console Wiring Harness to Instrument Panel Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
BK	—	<p01>	USB	I	—	USB Serial Data	BK	—	<p01>	USB	II	—

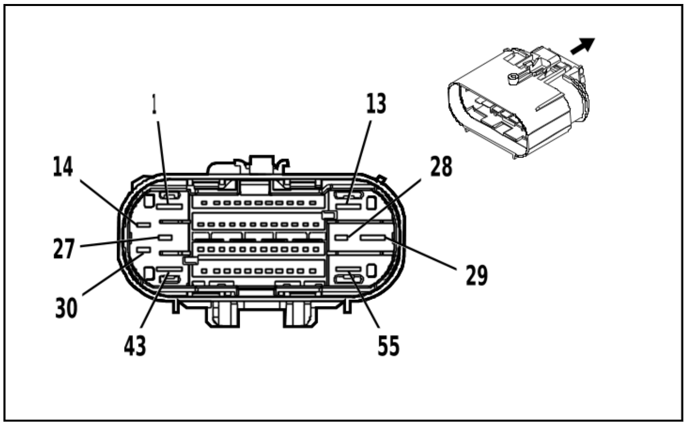
X227 Front Seat Wiring Harness - Center to Body Wiring Harness (D07)



4992168

Connector Part Information

- Harness Type: Front Floor Console Wiring Harness
- OEM Connector: 13522700
- Service Connector: Service by Harness - See Part Catalog
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)



4993301

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35605244
- Service Connector: 84727364
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required
III	Not required	J-35616-35 (VT)	No Tool Required
IV	Not required	J-35616-42 (RD)	No Tool Required
V	84847992	J-35616-32 (OG)	J-38125-36
VI	84867140	J-35616-13 (BU)	J-38125-553
VII	84992391	J-35616-5 (PU)	J-38125-36

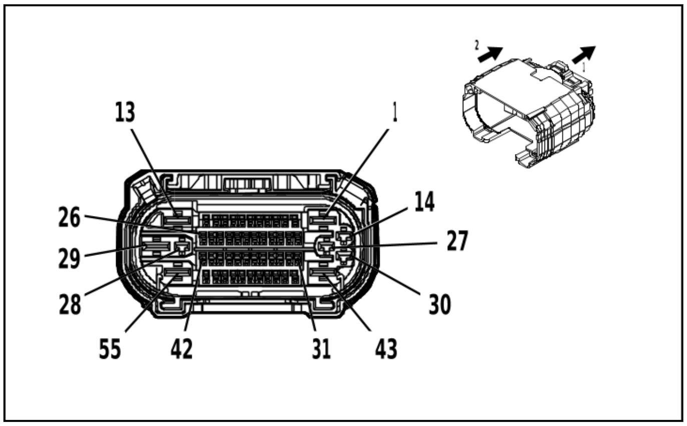
X227 Front Seat Wiring Harness - Center to Body Wiring Harness (D07)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1 - 5	—	—	—	—	—	Not Occupied	1 - 5	—	—	—	—	—
(6) 6	(6) 0.5	(6) RD / VT	(6) 2640	(6) II	(6) —	(6) Battery Positive Voltage	(6) 6	(6) 0.5	(6) RD / VT	(6) 2640	(6) VI	(6) —
(7) 7	(7) 0.35	(7) GN / BU	(7) 2733	(7) I	(7) —	(7) Brake System Control Module LIN Bus 2	(7) 7	(7) 0.5	(7) GN / BU	(7) 2733	(7) VI	(7) —
8	—	—	—	—	—	Not Occupied	8	—	—	—	—	—
(9) 9	(9) 0.5	(9) RD / BU	(9) 1240	(9) II	(9) —	(9) Battery Positive Voltage	(9) 9	(9) 0.5	(9) RD / BU	(9) 1240	(9) VI	(9) —
(10) 10	(10) 0.35	(10) BN / BK	(10) 3552	(10) I	(10) —	(10) Interior Passive Entry Antenna 1 High Signal	(10) 10	(10) 0.35	(10) BN / BK	(10) 3552	(10) VI	(10) —
(11) 11	(11) 0.35	(11) WH	(11) 3553	(11) I	(11) —	(11) Interior Passive Entry Antenna 1 Low Signal	(11) 11	(11) 0.35	(11) WH	(11) 3553	(11) VI	(11) —
12 - 13	—	—	—	—	—	Not Occupied	12 - 13	—	—	—	—	—
(14) 14	(14) 0.75	(14) BK	(14) 10117	(14) III	(14) —	(14) AC Outlet Phase A Control	(14) 14	(14) 0.75	(14) BK	(14) 10117	(14) VII	(14) —
15 - 21	—	—	—	—	—	Not Occupied	15 - 21	—	—	—	—	—
(22) 22	(22) 0.5	(22) BU / YE	(22) 4984	(22) II	(22) —	(22) AUTOSAR CAN Bus [-] 5 Serial Data	(22) 22	(22) 0.5	(22) BU / YE	(22) 4984	(22) VI	(22) —
(23) 23	(23) 0.5	(23) BU / WH	(23) 4985	(23) II	(23) —	(23) AUTOSAR CAN Bus [+] 5 Serial Data	(23) 23	(23) 0.5	(23) BU / WH	(23) 4985	(23) VI	(23) —
(24) 24	(24) 0.5	(24) BU / YE	(24) 4984	(24) II	(24) —	(24) AUTOSAR CAN Bus [-] 5 Serial Data	(24) 24	(24) 0.5	(24) BU / YE	(24) 4984	(24) VI	(24) —
(25) 25	(25) 0.5	(25) BU / WH	(25) 4985	(25) II	(25) —	(25) AUTOSAR CAN Bus [+] 5 Serial Data	(25) 25	(25) 0.5	(25) BU / WH	(25) 4985	(25) VI	(25) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(26) 26	(26) 0.5	(26) BK	(26) 1350	(26) II	(26) —	(26) Ground	(26) 26	(26) 0.75	(26) BK	(26) 1350	(26) VI	(26) —
(27) 27	(27) 0.5	(27) WH	(27) 10116	(27) III	(27) —	(27) AC Outlet Low Reference	(27) 27	(27) 0.5	(27) WH	(27) 10116	(27) VII	(27) —
28 - 29	—	—	—	—	—	Not Occupied	28 - 29	—	—	—	—	—
(30) 30	(30) 0.75	(30) RD	(30) 10118	(30) III	(30) —	(30) AC Outlet Phase B Control	(30) 30	(30) 0.75	(30) RD	(30) 10118	(30) VII	(30) —
31	—	—	—	—	—	Not Occupied	31	—	—	—	—	—
(32) 32	(32) 0.35	(32) BN / BK	(32) 4996	(32) I	(32) —	(32) Immobilizer Antenna Signal [+]	(32) 32	(32) 0.35	(32) BN / BK	(32) 4996	(32) VI	(32) —
(33) 33	(33) 0.35	(33) WH / GY	(33) 4997	(33) I	(33) —	(33) Immobilizer Antenna Low Signal	(33) 33	(33) 0.35	(33) WH / GY	(33) 4997	(33) VI	(33) —
34 - 35	—	—	—	—	—	Not Occupied	34 - 35	—	—	—	—	—
(36) 36	(36) 0.5	(36) RD / YE	(36) 2340	(36) II	(36) —	(36) Battery Positive Voltage	(36) 36	(36) 0.5	(36) RD / YE	(36) 2340	(36) VI	(36) —
(37) 37	(37) 0.5	(37) GN / VT	(37) 2857	(37) II	(37) —	(37) Body Control Module LIN Bus 11	(37) 37	(37) 0.35	(37) GN / VT	(37) 2857	(37) VI	(37) —
(38) 38	(38) 0.5	(38) VT / RD	(38) 4049	(38) II	(38) —	(38) AC Power Outlet Sensor High Reference	(38) 38	(38) 0.5	(38) VT / RD	(38) 4049	(38) VI	(38) —
39 - 41	—	—	—	—	—	Not Occupied	39 - 41	—	—	—	—	—
(42) 42	(42) 0.5	(42) BU / BN	(42) 6807	(42) II	(42) —	(42) DC/AC Inverter Control	(42) 42	(42) 0.5	(42) BU / BN	(42) 6807	(42) VI	(42) —
(43) 43	(43) 0.5	(43) GN / VT	(43) 4786	(43) IV	(43) —	(43) Dome/ Reading Lamp Enable Signal	(43) 43	(43) 0.5	(43) GN / VT	(43) 4786	(43) V	(43) —
(44) 44	(44) 0.75	(44) YE	(44) 6817	(44) II	(44) —	(44) LED Backlight Dimming Control 1	(44) 44	(44) 0.75	(44) YE	(44) 6817	(44) VI	(44) —
45 - 46	—	—	—	—	—	Not Occupied	45 - 46	—	—	—	—	—
(47) 47	(47) 0.5	(47) BK	(47) 1350	(47) II	(47) —	(47) Ground	(47) 47	(47) 0.75	(47) BK	(47) 1350	(47) VI	(47) —
(48) 48	(48) 0.35	(48) VT	(48) 4701	(48) I	(48) —	(48) Retained Accessory Power Control	(48) 48	(48) 0.35	(48) VT	(48) 4701	(48) VI	(48) —
49 - 50	—	—	—	—	—	Not Occupied	49 - 50	—	—	—	—	—
(51) 51	(51) 0.5	(51) BK / WH	(51) 1451	(51) II	(51) —	(51) Signal Ground	(51) 51	(51) 0.75	(51) BK / WH	(51) 1451	(51) VI	(51) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(52) 52	(52) 0.5	(52) BK / WH	(52) 1051	(52) II	(52) —	(52) Signal Ground (52) Signal Ground	(52) 52	(52) 0.75 (52) 0.5	(52) BK / WH (52) BK / WH	(52) 1051 (52) 1051	(52) VI (52) VI	(52) — (52) —
53 - 55	—	—	—	—	—	Not Occupied	53 - 55	—	—	—	—	—

X227 Front Seat Wiring Harness - Center to Body Wiring Harness (AZ3)



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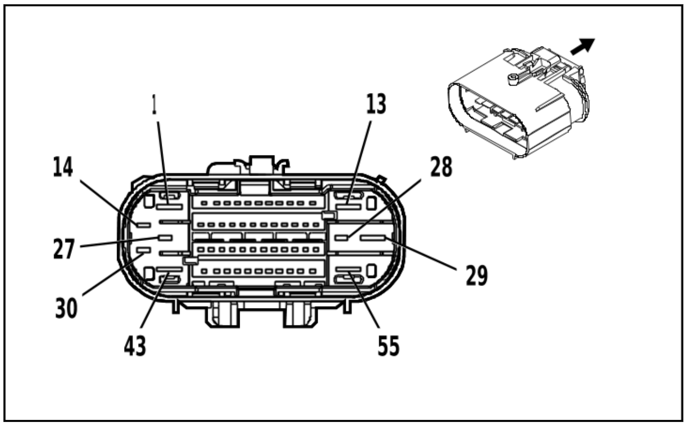


4993301

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Center
- OEM Connector: 13522700
- Service Connector: Service by Harness - See Part Catalog
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35605244
- Service Connector: 84727364
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-35 (VT)	No Tool Required
III	84867140	J-35616-13 (BU)	J-38125-553
IV	84992391	J-35616-5 (PU)	J-38125-36

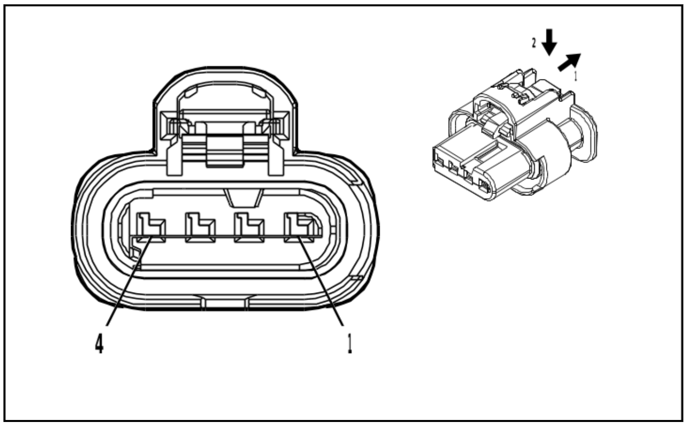
X227 Front Seat Wiring Harness - Center to Body Wiring Harness (AZ3)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1 - 6	—	—	—	—	—	Not Occupied	1 - 6	—	—	—	—	—
(7) 7	(7) —	(7) —	(7) —	(7) —	(7) —	(7) Brake System Control Module LIN Bus 2	(7) 7	(7) 0.5	(7) GN / BU	(7) 2733	(7) III	(7) —
8 - 13	—	—	—	—	—	Not Occupied	8 - 13	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(14) 14	(14) 0.75	(14) BK	(14) 10117	(14) II	(14) —	(14) AC Outlet Phase A Control	(14) 14	(14) 0.75	(14) BK	(14) 10117	(14) IV	(14) —
15	—	—	—	—	—	Not Occupied	15	—	—	—	—	—
(16) 16	(16) 0.35	(16) WH	(16) 4976	(16) I	(16) —	(16) AUTOSAR CAN Bus [-] 3 Serial Data	(16) 16	(16) —	(16) —	(16) —	(16) —	(16) —
(17) 17	(17) 0.35	(17) BU / BK	(17) 4977	(17) I	(17) —	(17) AUTOSAR CAN Bus [+] 3 Serial Data	(17) 17	(17) —	(17) —	(17) —	(17) —	(17) —
(18) 18	(18) 0.35	(18) WH	(18) 4976	(18) I	(18) —	(18) AUTOSAR CAN Bus [-] 3 Serial Data	(18) 18	(18) —	(18) —	(18) —	(18) —	(18) —
(19) 19	(19) 0.35	(19) BU / BK	(19) 4977	(19) I	(19) —	(19) AUTOSAR CAN Bus [+] 3 Serial Data	(19) 19	(19) —	(19) —	(19) —	(19) —	(19) —
20 - 21	—	—	—	—	—	Not Occupied	20 - 21	—	—	—	—	—
(22) 22	(22) 0.5	(22) BU / YE	(22) 4984	(22) I	(22) —	(22) AUTOSAR CAN Bus [-] 5 Serial Data	(22) 22	(22) —	(22) —	(22) —	(22) —	(22) —
(23) 23	(23) 0.5	(23) BU / WH	(23) 4985	(23) I	(23) —	(23) AUTOSAR CAN Bus [+] 5 Serial Data	(23) 23	(23) —	(23) —	(23) —	(23) —	(23) —
(24) 24	(24) 0.5	(24) BU / YE	(24) 4984	(24) I	(24) —	(24) AUTOSAR CAN Bus [-] 5 Serial Data	(24) 24	(24) —	(24) —	(24) —	(24) —	(24) —
(25) 25	(25) 0.5	(25) BU / WH	(25) 4985	(25) I	(25) —	(25) AUTOSAR CAN Bus [+] 5 Serial Data	(25) 25	(25) —	(25) —	(25) —	(25) —	(25) —
(26) 26	(26) 0.75	(26) BK	(26) 1050	(26) I	(26) —	(26) Ground	(26) 26	(26) 0.75	(26) BK	(26) 1350	(26) III	(26) —
(27) 27	(27) 0.35	(27) BK	(27) 10116	(27) II	(27) —	(27) AC Outlet Low Reference	(27) 27	(27) 0.5	(27) WH	(27) 10116	(27) IV	(27) —
28 - 29	—	—	—	—	—	Not Occupied	28 - 29	—	—	—	—	—
(30) 30	(30) 0.75	(30) RD	(30) 10118	(30) II	(30) —	(30) AC Outlet Phase B Control	(30) 30	(30) 0.75	(30) RD	(30) 10118	(30) IV	(30) —
31	—	—	—	—	—	Not Occupied	31	—	—	—	—	—
(32) 32	(32) 0.5	(32) BN / BK	(32) 4996	(32) I	(32) —	(32) Immobilizer Antenna Signal [+]	(32) 32	(32) 0.35	(32) BN / BK	(32) 4996	(32) III	(32) —
(33) 33	(33) 0.5	(33) WH / GY	(33) 4997	(33) I	(33) —	(33) Immobilizer Antenna Low Signal	(33) 33	(33) 0.35	(33) WH / GY	(33) 4997	(33) III	(33) —
34 - 37	—	—	—	—	—	Not Occupied	34 - 37	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(38) 38	(38) 0.75	(38) V T / RD	(38) 40 49	(38) I	(38) —	(38) AC Power Outlet Sensor High Reference	(38) 38	(38) 0.5	(38) V T / RD	(38) 40 49	(38) III	(38) —
39	—	—	—	—	—	Not Occupied	39	—	—	—	—	—
(40) 40	(40) 0.35	(40) WH	(40) 40 55	(40) I	(40) —	(40) Private Serial Data Powertrain CAN Bus [+] Serial Data	(40) 40	(40) —	(40) —	(40) —	(40) —	(40) —
41	—	—	—	—	—	Not Occupied	41	—	—	—	—	—
(42) 42	(42) 0.75	(42) B U / BN	(42) 68 07	(42) I	(42) —	(42) DC/AC Inverter Control	(42) 42	(42) 0.5	(42) B U / BN	(42) 68 07	(42) III	(42) —
43	—	—	—	—	—	Not Occupied	43	—	—	—	—	—
(44) 44	(44) 0.75	(44) Y E	(44) 68 17	(44) I	(44) —	(44) LED Backlight Dimming Control 1	(44) 44	(44) 0.75	(44) Y E	(44) 68 17	(44) III	(44) —
(45) 45	(45) 0.35	(45) B U / GY	(45) 40 54	(45) I	(45) —	(45) Private Serial Data Powertrain CAN Bus [-] Serial Data	(45) 45	(45) —	(45) —	(45) —	(45) —	(45) —
(46) 46	(46) 0.35	(46) WH	(46) 40 55	(46) I	(46) —	(46) Private Serial Data Powertrain CAN Bus [+] Serial Data	(46) 46	(46) —	(46) —	(46) —	(46) —	(46) —
(47) 47	(47) 0.35	(47) B K	(47) 13 50	(47) I	(47) —	(47) Ground	(47) 47	(47) 0.75	(47) B K	(47) 13 50	(47) III	(47) —
(48) 48	(48) 0.35	(48) V T	(48) 47 01	(48) I	(48) —	(48) Retained Accessory Power Control	(48) 48	(48) 0.35	(48) V T	(48) 47 01	(48) III	(48) —
49 - 52	—	—	—	—	—	Not Occupied	49 - 52	—	—	—	—	—
(53) 53	(53) 0.35	(53) B U / GY	(53) 40 54	(53) I	(53) —	(53) Private Serial Data Powertrain CAN Bus [-] Serial Data	(53) 53	(53) —	(53) —	(53) —	(53) —	(53) —
54 - 55	—	—	—	—	—	Not Occupied	54 - 55	—	—	—	—	—

X237 Instrument Panel Wiring Harness to Instrument Panel Airbag Wiring Harness



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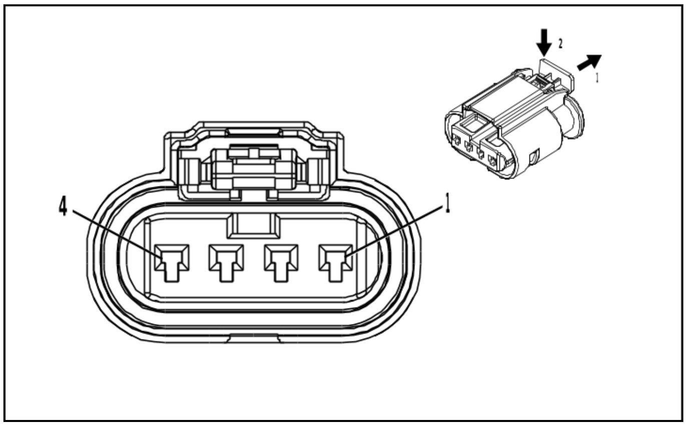


4256222

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 2296700-3
- Service Connector: 19371193
- Description: 4-Way F 1.2 MCON-CB Series, Sealed(YE)

Connector Part Information

- Harness Type: Instument Panel Airbag Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M (YE)

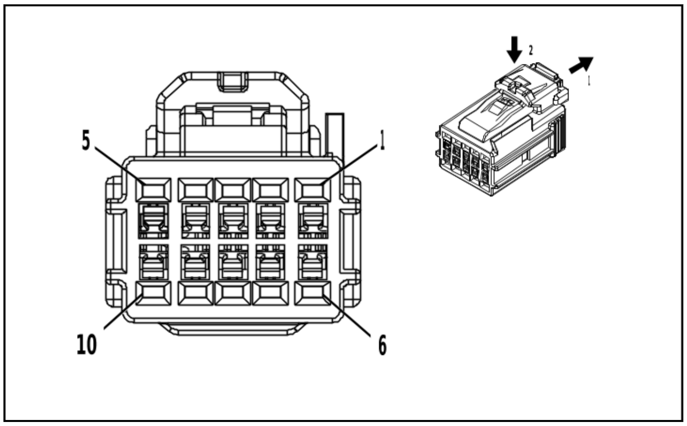
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	No Tool Required	No Tool Required

X237 Instrument Panel Wiring Harness to Instrument Panel Airbag Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) YE / OG	(1) 3025	(1) I	(1) —	(1) Passenger Instrument Panel Air Bag Stage 1 High Control	(1) 1	(1) 0.35	(1) YE / OG	(1) 3025	(1) II	(1) —
(2) 2	(2) 0.35	(2) OG / WH	(2) 3024	(2) I	(2) —	(2) Passenger Instrument Panel Air Bag Stage 1 Low Control	(2) 2	(2) 0.35	(2) OG / WH	(2) 3024	(2) II	(2) —
(3) 3	(3) 0.35	(3) GY / OG	(3) 3027	(3) I	(3) —	(3) Passenger Instrument Panel Air Bag Stage 2 High Control	(3) 3	(3) 0.35	(3) GY / OG	(3) 3027	(3) II	(3) —
(4) 4	(4) 0.35	(4) OG / VT	(4) 3026	(4) I	(4) —	(4) Passenger Instrument Panel Air Bag Stage 2 Low Control	(4) 4	(4) 0.35	(4) OG / VT	(4) 3026	(4) II	(4) —

X250 Instrument Panel Wiring Harness to Heater Wiring Harness



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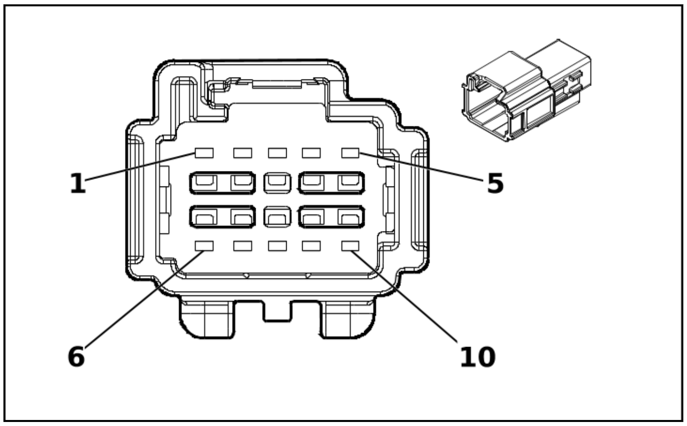


5355759

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6098-9004
- Service Connector: 13532428
- Description: 10-Way F 1.2 Series(BK)

Connector Part Information

- Harness Type: Heater Wiring Harness
- OEM Connector: 6098-9079
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way M 1.2 MCON Series(BK)

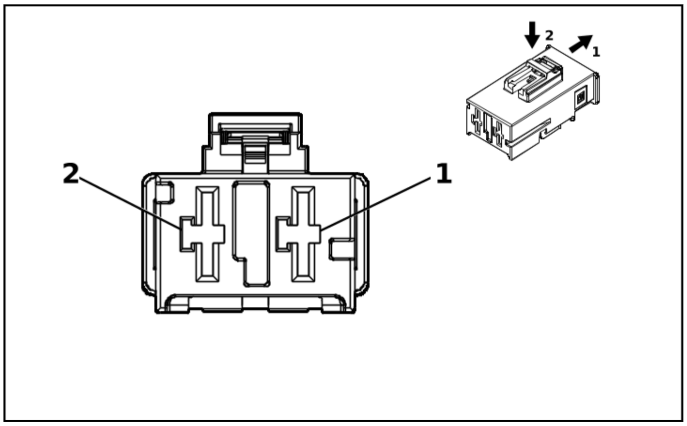
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	84962854	J-35616-12 (BU)	J-38125-215A
II	Not required	J-35616-17 (L-GN)	No Tool Required

X250 Instrument Panel Wiring Harness to Heater Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1	—	—	—	—	—	Not Occupied	1	—	—	—	—	—
(2) 2	(2) 0.5	(2) BK	(2) 1050	(2) I	(2) —	(2) Ground	(2) 2	(2) 0.35	(2) BK	(2) 1050	(2) II	(2) —
3 - 4	—	—	—	—	—	Not Occupied	3 - 4	—	—	—	—	—
(5) 5	(5) 0.35	(5) GY	(5) 6137	(5) I	(5) —	(5) Air Conditioning Evaporator Temperature Sensor Signal	(5) 5	(5) 0.35	(5) BN	(5) 6137	(5) II	(5) —
(6) 6	(6) 0.35	(6) GN / VT	(6) 2852	(6) I	(6) —	(6) Body Control Module LIN Bus 6	(6) 6	(6) 0.35	(6) BU	(6) 2852	(6) II	(6) —
(7) 7	(7) 0.35	(7) BK / YE	(7) 407	(7) I	(7) —	(7) Sensor Low Reference	(7) 7	(7) 0.35	(7) BK / YE	(7) 407	(7) II	(7) —
(8) 8	(8) 0.5	(8) VT / BK	(8) 339	(8) I	(8) —	(8) Run/ Crank Ignition 1 Voltage	(8) 8	(8) 0.35	(8) VT / BK	(8) 339	(8) II	(8) —
(9) 9	(9) 0.35	(9) WH / YE	(9) 4634	(9) I	(9) —	(9) HVAC Remote Enable Signal	(9) 9	(9) 0.35	(9) RD	(9) 4634	(9) II	(9) —
10	—	—	—	—	—	Not Occupied	10	—	—	—	—	—

X251 Auxiliary Heater Wiring Harness to Body Wiring Harness



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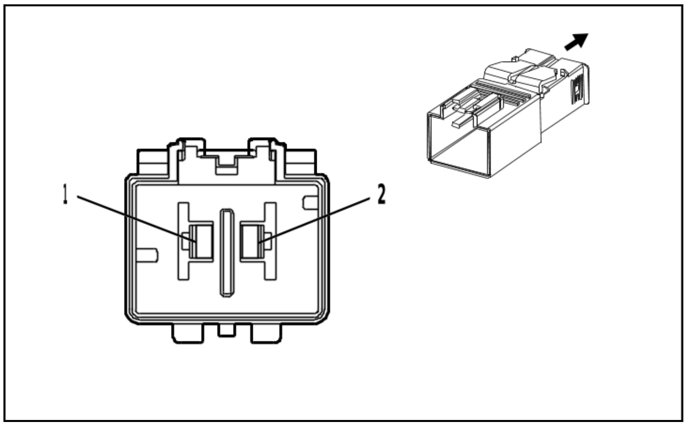


4891120

Connector Part Information

- Harness Type: Auxiliary Heater Wiring Harness
- OEM Connector: 13525311
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 9.5 MCON-LL Series(BK)

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 2317373-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 9.5 MCON-LL Series(BK)

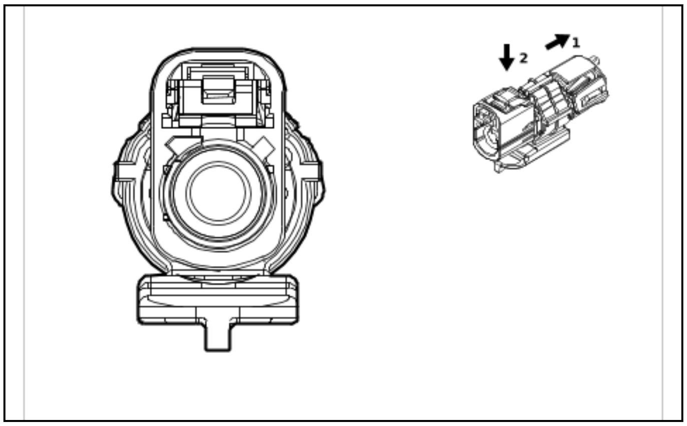
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-22 (RD)	No Tool Required
II	Not required	J-35616-21 (RD)	No Tool Required

X251 Auxiliary Heater Wiring Harness to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1	—	—	—	—	—	Not Occupied	1	—	—	—	—	—
(2) 2	(2) 10	(2) RD / GY	(2) 642	(2) I	(2) —	(2) Battery Positive Voltage	(2) 2	(2) 10	(2) RD / GY	(2) 642	(2) II	(2) —

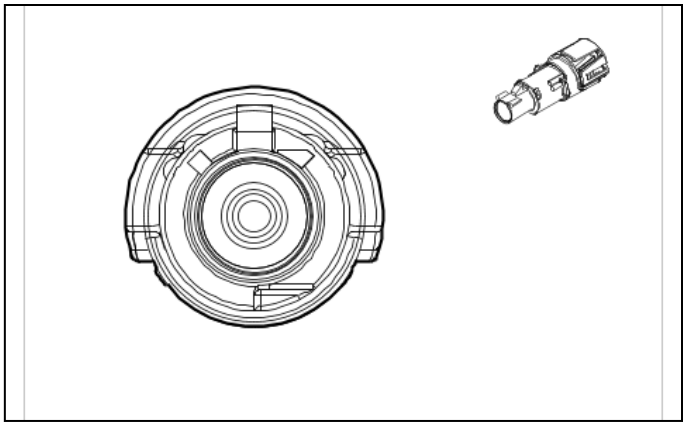
X309A Body Wiring Harness to Inside Rearview Mirror Wiring Harness (UVN)



5519150

Connector Part Information

- Harness Type: Body Wiring Harness COAX
- OEM Connector: 35187047
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type, Sealed(BK)



5518522

Connector Part Information

- Harness Type: Inside Rearview Mirror Wiring Harness COAX
- OEM Connector: 33355538
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way M Coax Type(BK)

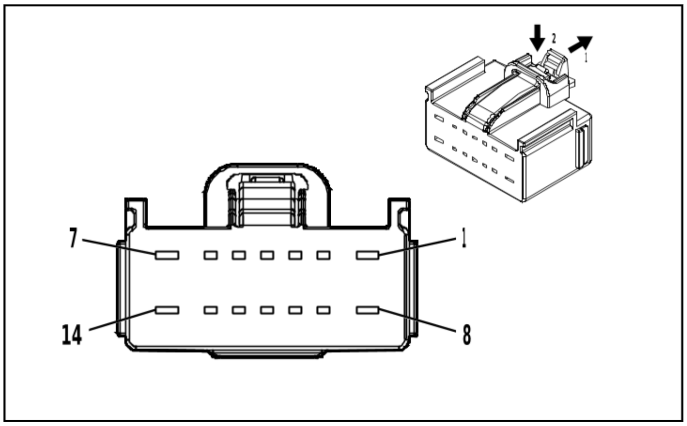
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X309A Body Wiring Harness to Inside Rearview Mirror Wiring Harness (UVN)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
—	—	Coax Cable	—	I	—	Cargo Bed Rear Vision Camera Coaxial Video Signal	—	—	Coax Cable	—	I	—

X324 Body Wiring Harness to Body Rear Wiring Harness Extension Harness



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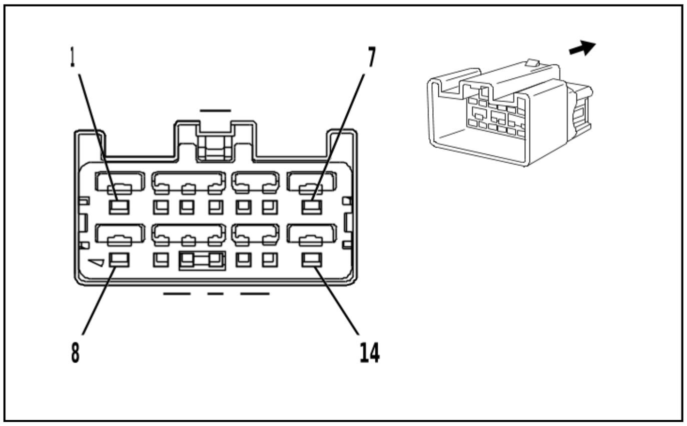


1283905

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 7289-7630-30
- Service Connector: 13513604
- Description: 14-Way F 1.5, 2.8 YESC Series(BK)

Connector Part Information

- Harness Type: Body Rear Wiring Harness Extension Harness
- OEM Connector: 7282-6447-40
- Service Connector: Service by Harness - See Part Catalog
- Description: 14-Way M 1.5, 2.8 YESC Series(L-GY)

Terminal Part Information

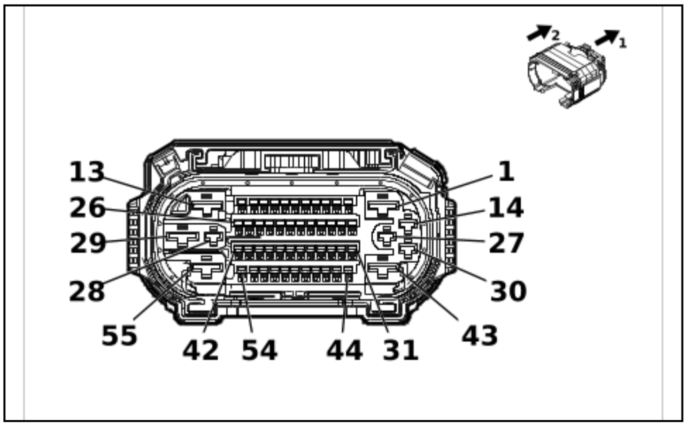
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13575850	J-35616-2A (GY)	J-38125-557
II	84962855	J-35616-4A (PU)	J-38125-11A
III	Not required	J-35616-3 (GY)	No Tool Required
IV	Not required	J-35616-5 (PU)	No Tool Required

X324 Body Wiring Harness to Body Rear Wiring Harness Extension Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) II	(1) —	(1) AC Outlet Phase A Control	(1) 1	(1) 0.75	(1) BK	(1) 10117	(1) IV	(1) —
(2) 2	(2) 0.5	(2) VT / RD	(2) 4049	(2) I	(2) —	(2) AC Power Outlet Sensor High Reference	(2) 2	(2) 0.5	(2) VT / RD	(2) 4049	(2) III	(2) —
(3) 3	(3) 0.35	(3) VT / WH	(3) 239	(3) I	(3) —	(3) Run/ Crank Ignition 1 Voltage	(3) 3	(3) 0.35	(3) VT / WH	(3) 239	(3) III	(3) —
(4) 4	(4) 0.5	(4) WH / GN	(4) 4628	(4) I	(4) —	(4) DC/AC Inverter Relay Control	(4) 4	(4) 0.5	(4) WH / GN	(4) 4628	(4) III	(4) —
(5) 5	(5) 0.5	(5) BU / BN	(5) 6807	(5) I	(5) —	(5) DC/AC Inverter Control	(5) 5	(5) 0.5	(5) BU / BN	(5) 6807	(5) III	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—
(7) 7	(7) 0.75	(7) BK / WH	(7) 10120	(7) II	(7) —	(7) AC Outlet 2 Phase A Control	(7) 7	(7) 0.75	(7) BK / WH	(7) 10120	(7) IV	(7) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(8) 8	(8) 0.75	(8) RD	(8) 10118	(8) II	(8) —	(8) AC Outlet Phase B Control	(8) 8	(8) 0.75	(8) RD	(8) 10118	(8) IV	(8) —
(9) 9	(9) 0.35	(9) BARE	(9) 10116	(9) I	(9) —	(9) AC Outlet Low Reference	(9) 9	(9) 0.35	(9) BARE	(9) 10116	(9) III	(9) —
(10) 10	(10) 0.35	(10) GN / BU	(10) 6133	(10) I	(10) —	(10) Body Control Module LIN Bus 2	(10) 10	(10) 0.5	(10) GN / BU	(10) 6133	(10) III	(10) —
11	—	—	—	—	—	Not Occupied	11	—	—	—	—	—
(12) 12	(12) 0.5	(12) GN / BN	(12) 2266	(12) I	(12) —	(12) DC/AC Inverter Control 2	(12) 12	(12) 0.5	(12) GN / BN	(12) 2266	(12) III	(12) —
(13) 13	(13) 0.35	(13) BARE	(13) 10119	(13) I	(13) —	(13) AC Outlet 2 Low Reference	(13) 13	(13) 0.35	(13) BARE	(13) 10119	(13) III	(13) —
(14) 14	(14) 0.75	(14) RD / WH	(14) 10121	(14) II	(14) —	(14) AC Outlet 2 Phase B Control	(14) 14	(14) 0.75	(14) RD / WH	(14) 10121	(14) IV	(14) —

X331 Front Seat Wiring Harness - Driver to Body Wiring Harness



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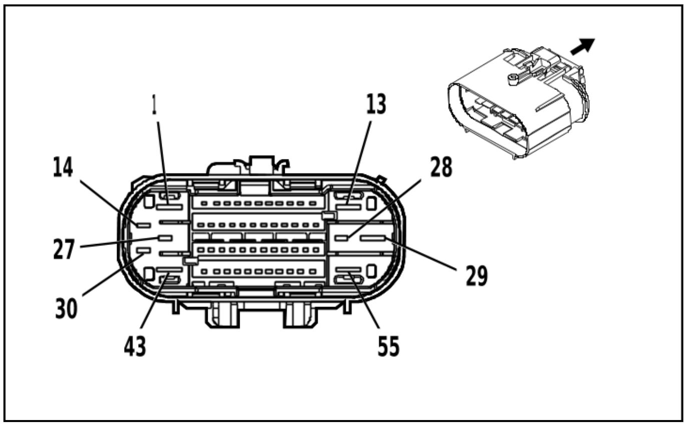


4993301

Connector Part Information

- Harness Type: Front Seat Wiring Harness - Driver
- OEM Connector: 35572204
- Service Connector: Service by Harness - See Part Catalog
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35601287
- Service Connector: 84727364
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-42 (RD)	No Tool Required
III	Not required	No Tool Required	No Tool Required
IV	84847992	J-35616-32 (OG)	J-38125-36
V	84867140	J-35616-13 (BU)	J-38125-553

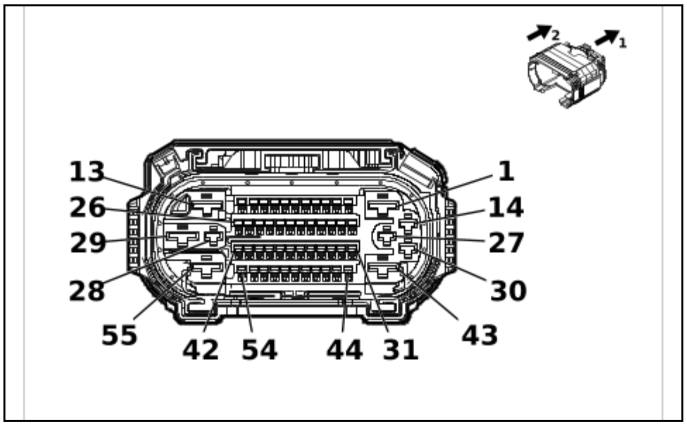
X331 Front Seat Wiring Harness - Driver to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) BK	(1) 1550	(1) II	(1) —	(1) Ground	(1) 1	(1) 2.5	(1) BK	(1) 1550	(1) IV	(1) —
2 - 3	—	—	—	—	—	Not Occupied	2 - 3	—	—	—	—	—
(4) 4	(4) 0.5 (4) 0.75	(4) RD / BN (4) RD / BN	(4) 2240 (4) 2240	(4) I (4) I	(4) — (4) —	(4) Battery Positive Voltage (4) Battery Positive Voltage	(4) 4	(4) 0.5	(4) RD / BN	(4) 2240	(4) V	(4) —
(5) 5	(5) 0.35	(5) GN / WH	(5) 7530	(5) I	(5) —	(5) Driver Seat Adjuster Memory Module LIN Bus 1	(5) 5	(5) —	(5) —	(5) —	(5) —	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—
(7) 7	(7) 0.35	(7) WH	(7) 615	(7) I	(7) —	(7) Seat Memory Switch Signal 1	(7) 7	(7) 0.35	(7) WH	(7) 615	(7) V	(7) —
(8) 8	(8) 0.35	(8) BU / GN	(8) 614	(8) I	(8) —	(8) Seat Memory Switch Set Signal	(8) 8	(8) 0.35	(8) BU / GN	(8) 614	(8) V	(8) —
9 - 14	—	—	—	—	—	Not Occupied	9 - 14	—	—	—	—	—
(15) 15	(15) 0.75	(15) BN / VT	(15) 2077	(15) I	(15) —	(15) Driver Seat Heating Element Control	(15) 15	(15) 0.75	(15) BN / VT	(15) 2077	(15) V	(15) —
(16) 16	(16) 0.75	(16) BN / BK	(16) 2078	(16) I	(16) —	(16) Driver Seat Heating Element Low Reference	(16) 16	(16) 0.75	(16) BN / BK	(16) 2078	(16) V	(16) —
(17) 17	(17) 0.5	(17) YE / GY	(17) 2079	(17) I	(17) —	(17) Driver Seat Heating Temperature Sensor Signal	(17) 17	(17) 0.5	(17) YE / GY	(17) 2079	(17) V	(17) —
(18) 18	(18) 0.5	(18) BK / YE	(18) 2080	(18) I	(18) —	(18) Driver Heated Seat Thermistor Low Reference	(18) 18	(18) 0.5	(18) BK / YE	(18) 2080	(18) V	(18) —
(19) 19	(19) 0.5	(19) BU	(19) 2425	(19) I	(19) —	(19) Driver Seat Back Heating Temperature Sensor Signal	(19) 19	(19) 0.5	(19) BU	(19) 2425	(19) V	(19) —
(20) 20	(20) 0.75	(20) BN	(20) 2432	(20) I	(20) —	(20) Driver Seat Back Heating Element Control	(20) 20	(20) 0.75	(20) BN	(20) 2432	(20) V	(20) —
21 - 28	—	—	—	—	—	Not Occupied	21 - 28	—	—	—	—	—
(29) 29	(29) 2.5	(29) RD / YE	(29) 5040	(29) II	(29) —	(29) Battery Positive Voltage	(29) 29	(29) 2.5	(29) RD / YE	(29) 5040	(29) IV	(29) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
30	—	—	—	—	—	Not Occupied	30	—	—	—	—	—
(31) 31	(31) 0.35 (31) 0.5	(31) OG / BN (31) OG / GY	(31) 238 (31) 2652	(31) I (31) I	(31) — (31) —	(31) Driver Seat Belt Switch Signal (31) Driver Seat Belt Sensor Signal	(31) 31	(31) 0.35	(31) OG / BN	(31) 238	(31) V	(31) —
(32) 32	(32) 0.5	(32) BK / OG	(32) 1363	(32) I	(32) —	(32) Driver Seat Belt Switch Low Reference	(32) 32	(32) 0.5	(32) BK / OG	(32) 1363	(32) V	(32) —
33	—	—	—	—	—	Not Occupied	33	—	—	—	—	—
(34) 34	(34) 0.5 (34) 0.5	(34) BK / OG (34) BK / OG	(34) 4963 (34) 4963	(34) III (34) I	(34) — (34) —	(34) Driver Seat Back Air Bag Low Control (34) Driver Seat Back Air Bag Low Control	(34) 34	(34) 0.5	(34) BK / OG	(34) 4963	(34) V	(34) —
(35) 35	(35) 0.5 (35) 0.5	(35) OG / BU (35) OG / BU	(35) 4962 (35) 4962	(35) III (35) I	(35) — (35) —	(35) Driver Seat Back Air Bag High Control (35) Driver Seat Back Air Bag High Control	(35) 35	(35) 0.5	(35) OG / BU	(35) 4962	(35) V	(35) —
36 - 40	—	—	—	—	—	Not Occupied	36 - 40	—	—	—	—	—
(41) 41	(41) 0.35 (41) 0.5	(41) BU / VT (41) BU / VT	(41) 4101 (41) 4101	(41) I (41) I	(41) — (41) —	(41) AUTOSAR CAN Bus [+] 4 Serial Data (41) AUTOSAR CAN Bus [+] 4 Serial Data	(41) 41	(41) 0.5	(41) BU / VT	(41) 4101	(41) V	(41) —
(42) 42	(42) 0.35 (42) 0.5	(42) WH (42) WH	(42) 4100 (42) 4100	(42) I (42) I	(42) — (42) —	(42) AUTOSAR CAN Bus [-] 4 Serial Data (42) AUTOSAR CAN Bus [-] 4 Serial Data	(42) 42	(42) 0.5	(42) WH	(42) 4100	(42) V	(42) —
43 - 49	—	—	—	—	—	Not Occupied	43 - 49	—	—	—	—	—
(50) 50	(50) 0.35 (50) 0.5	(50) BU / VT (50) BU / VT	(50) 4101 (50) 4101	(50) I (50) I	(50) — (50) —	(50) AUTOSAR CAN Bus [+] 4 Serial Data (50) AUTOSAR CAN Bus [+] 4 Serial Data	(50) 50	(50) 0.5	(50) BU / VT	(50) 4101	(50) V	(50) —
(51) 51	(51) 0.35 (51) 0.5	(51) WH (51) WH	(51) 4100 (51) 4100	(51) I (51) I	(51) — (51) —	(51) AUTOSAR CAN Bus [-] 4 Serial Data (51) AUTOSAR CAN Bus [-] 4 Serial Data	(51) 51	(51) 0.5	(51) WH	(51) 4100	(51) V	(51) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(52) 52	(52) 0.5	(52) GN / VT	(52) 5906	(52) I	(52) —	(52) Driver Seat Blower Motor Control 1	(52) 52	(52) 0.5	(52) GN / VT	(52) 5906	(52) V	(52) —
(53) 53	(53) 0.75	(53) VT / WH	(53) 1139	(53) I	(53) —	(53) Run/ Crank Ignition 1 Voltage	(53) 53	(53) 0.75	(53) VT / WH	(53) 1139	(53) V	(53) —
54 - 55	—	—	—	—	—	Not Occupied	54 - 55	—	—	—	—	—

X336 Front Seat Wiring Harness - Passenger to Body Wiring Harness



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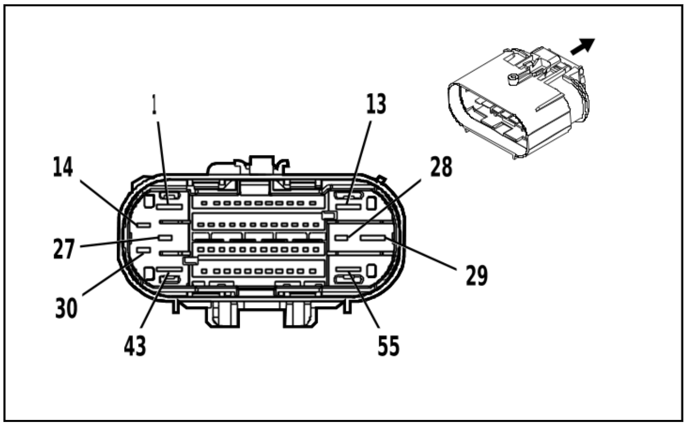


4993301

Connector Part Information
- Harness Type: Front Seat Wiring Harness - Passenger
- OEM Connector: 35572205
- Service Connector: Service by Harness - See Part Catalog
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35592429
- Service Connector: 84727364
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-42 (RD)	No Tool Required
III	Not required	No Tool Required	No Tool Required
IV	84847992	J-35616-32 (OG)	J-38125-36
V	84867140	J-35616-13 (BU)	J-38125-553

X336 Front Seat Wiring Harness - Passenger to Body Wiring Harness

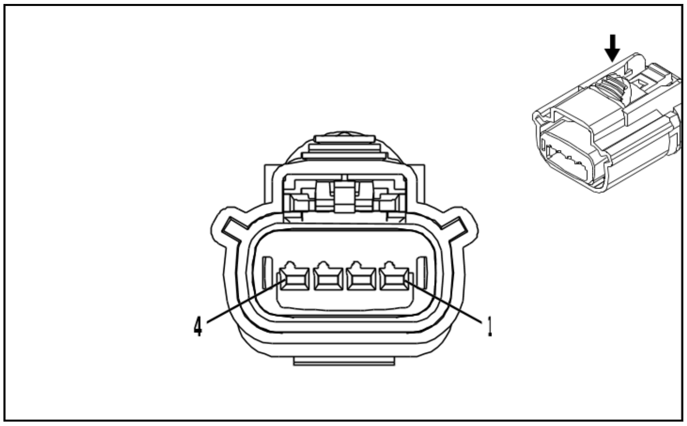
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75 (1) 2.5	(1) BK (1) BK	(1) 1350 (1) 1350	(1) II (1) II	(1) — (1) A7K / AVU / KA1	(1) Ground (1) Ground	(1) 1	(1) 2.5	(1) BK	(1) 1350	(1) IV	(1) —
2	—	—	—	—	—	Not Occupied	2	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(3) 3	(3) 0.75	(3) RD / GN	(3) 6140	(3) I	(3) —	(3) Battery Positive Voltage	(3) 3	(3) 0.75	(3) RD / GN	(3) 6140	(3) V	(3) —
(4) 4	(4) 0.5	(4) RD / BN	(4) 2240	(4) I	(4) —	(4) Battery Positive Voltage	(4) 4	(4) 0.5	(4) RD / BN	(4) 2240	(4) V	(4) —
(5) 5	(5) 0.75	(5) RD / BN	(5) 6640	(5) I	(5) —	(5) Battery Positive Voltage	(5) 5	(5) 0.75	(5) RD / BN	(5) 6640	(5) V	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—
(7) 7	(7) 0.5	(7) BU	(7) 4987	(7) I	(7) —	(7) AUTOSAR CAN Bus [+] 1 Serial Data	(7) 7	(7) 0.5	(7) BU	(7) 4987	(7) V	(7) —
(8) 8	(8) 0.5	(8) WH	(8) 4986	(8) I	(8) —	(8) AUTOSAR CAN Bus [-] 1 Serial Data	(8) 8	(8) 0.5	(8) WH	(8) 4986	(8) V	(8) —
9 - 14	—	—	—	—	—	Not Occupied	9 - 14	—	—	—	—	—
(15) 15	(15) 0.75	(15) BN / VT	(15) 2077	(15) I	(15) —	(15) Driver Seat Heating Element Control	(15) 15	(15) 0.75	(15) BN / VT	(15) 2077	(15) V	(15) —
(16) 16	(16) 0.75	(16) BN / BK	(16) 2078	(16) I	(16) —	(16) Driver Seat Heating Element Low Reference	(16) 16	(16) 0.75	(16) BN / BK	(16) 2078	(16) V	(16) —
(17) 17	(17) 0.5	(17) YE / GY	(17) 2079	(17) I	(17) —	(17) Driver Seat Heating Temperature Sensor Signal	(17) 17	(17) 0.5	(17) YE / GY	(17) 2079	(17) V	(17) —
(18) 18	(18) 0.5	(18) BK / YE	(18) 2080	(18) I	(18) —	(18) Driver Heated Seat Thermistor Low Reference	(18) 18	(18) 0.5	(18) BK / YE	(18) 2080	(18) V	(18) —
(19) 19	(19) 0.5	(19) BU	(19) 2425	(19) I	(19) —	(19) Driver Seat Back Heating Temperature Sensor Signal	(19) 19	(19) 0.5	(19) BU	(19) 2425	(19) V	(19) —
(20) 20	(20) 0.75	(20) BN	(20) 2432	(20) I	(20) —	(20) Driver Seat Back Heating Element Control	(20) 20	(20) 0.75	(20) BN	(20) 2432	(20) V	(20) —
(21) 21	(21) 0.5	(21) GN / VT	(21) 2857	(21) I	(21) —	(21) Body Control Module LIN Bus 11	(21) 21	(21) 0.35	(21) GN / VT	(21) 2857	(21) V	(21) —
22	—	—	—	—	—	Not Occupied	22	—	—	—	—	—
(23) 23	(23) 0.5	(23) RD / GN	(23) 4440	(23) I	(23) —	(23) Battery Positive Voltage	(23) 23	(23) 0.5	(23) RD / GN	(23) 4440	(23) V	(23) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(24) 24	(24) 0.5 (24) 0.5	(24) GY / OG (24) GY / OG	(24) 3746 (24) 3946	(24) I (24) I	(24) — (24) —	(24) Camshaft Exhaust Lobe Axial Position Signal 1 (24) Passenger Automatic Locking Retractor Switch Low Reference	(24) 24	(24) 0.35	(24) GY / OG	(24) 3946	(24) V	(24) —
(25) 25	(25) 0.5 (25) 0.5	(25) OG / BN (25) OG / BN	(25) 3747 (25) 3947	(25) I (25) I	(25) — (25) —	(25) Camshaft Exhaust Lobe Axial Position Signal 2 (25) Passenger Automatic Locking Retractor Switch Signal	(25) 25	(25) 0.35	(25) OG / BN	(25) 3947	(25) V	(25) —
(26) 26	(26) 0.5	(26) BK / WH	(26) 1251	(26) I	(26) —	(26) Signal Ground	(26) 26	(26) 0.5	(26) BK / WH	(26) 1251	(26) V	(26) —
27 - 28	—	—	—	—	—	Not Occupied	27 - 28	—	—	—	—	—
(29) 29	(29) 2.5 (29) 2.5	(29) RD / YE (29) RD / GY	(29) 7440 (29) 7440	(29) II (29) II	(29) — (29) —	(29) Battery Positive Voltage (29) Battery Positive Voltage	(29) 29	(29) 2.5	(29) RD / YE	(29) 7440	(29) IV	(29) —
30	—	—	—	—	—	Not Occupied	30	—	—	—	—	—
(31) 31	(31) 0.5	(31) OG / VT	(31) 1362	(31) I	(31) —	(31) Passenger Seat Belt Switch Signal	(31) 31	(31) 0.35	(31) OG / VT	(31) 1362	(31) V	(31) —
(32) 32	(32) 0.5	(32) BK / OG	(32) 1363	(32) I	(32) —	(32) Driver Seat Belt Switch Low Reference	(32) 32	(32) 0.5	(32) BK / OG	(32) 1363	(32) V	(32) —
33	—	—	—	—	—	Not Occupied	33	—	—	—	—	—
(34) 34	(34) 0.5 (34) 0.5	(34) BU / OG (34) BU / OG	(34) 4957 (34) 4957	(34) III (34) I	(34) — (34) —	(34) Passenger Seat Back Air Bag Low Control (34) Passenger Seat Back Air Bag Low Control	(34) 34	(34) 0.5	(34) BU / OG	(34) 4957	(34) V	(34) —
(35) 35	(35) 0.5 (35) 0.5	(35) OG / GY (35) OG / GY	(35) 4956 (35) 4956	(35) III (35) I	(35) — (35) —	(35) Passenger Seat Back Air Bag High Control (35) Passenger Seat Back Air Bag High Control	(35) 35	(35) 0.5	(35) OG / GY	(35) 4956	(35) V	(35) —
(36) 36	(36) 0.5	(36) GN / VT	(36) 5906	(36) I	(36) —	(36) Driver Seat Blower Motor Control 1	(36) 36	(36) 0.5	(36) GN / VT	(36) 5906	(36) V	(36) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(37) 37	(37) 0.75	(37) VT / WH	(37) 1139	(37) I	(37) —	(37) Run/ Crank Ignition 1 Voltage	(37) 37	(37) 0.75	(37) VT / WH	(37) 1139	(37) V	(37) —
38 - 40	—	—	—	—	—	Not Occupied	38 - 40	—	—	—	—	—
(41) 41	(41) 0.35	(41) BU / VT	(41) 4101	(41) I	(41) —	(41) AUTOSAR CAN Bus [+] 4 Serial Data	(41) 41	(41) 0.5	(41) BU / VT	(41) 4101	(41) V	(41) —
(42) 42	(42) 0.35	(42) WH	(42) 4100	(42) I	(42) —	(42) AUTOSAR CAN Bus [-] 4 Serial Data	(42) 42	(42) 0.5	(42) WH	(42) 4100	(42) V	(42) —
43 - 49	—	—	—	—	—	Not Occupied	43 - 49	—	—	—	—	—
(50) 50	(50) 0.35	(50) BU / VT	(50) 4101	(50) I	(50) —	(50) AUTOSAR CAN Bus [+] 4 Serial Data	(50) 50	(50) 0.5	(50) BU / VT	(50) 4101	(50) V	(50) —
(51) 51	(51) 0.35	(51) WH	(51) 4100	(51) I	(51) —	(51) AUTOSAR CAN Bus [-] 4 Serial Data	(51) 51	(51) 0.5	(51) WH	(51) 4100	(51) V	(51) —
(52) 52	(52) 0.5	(52) BU	(52) 4987	(52) I	(52) —	(52) AUTOSAR CAN Bus [+] 1 Serial Data	(52) 52	(52) 0.5	(52) BU	(52) 4987	(52) V	(52) —
(53) 53	(53) 0.5	(53) WH	(53) 4986	(53) I	(53) —	(53) AUTOSAR CAN Bus [-] 1 Serial Data	(53) 53	(53) 0.5	(53) WH	(53) 4986	(53) V	(53) —
54 - 55	—	—	—	—	—	Not Occupied	54 - 55	—	—	—	—	—

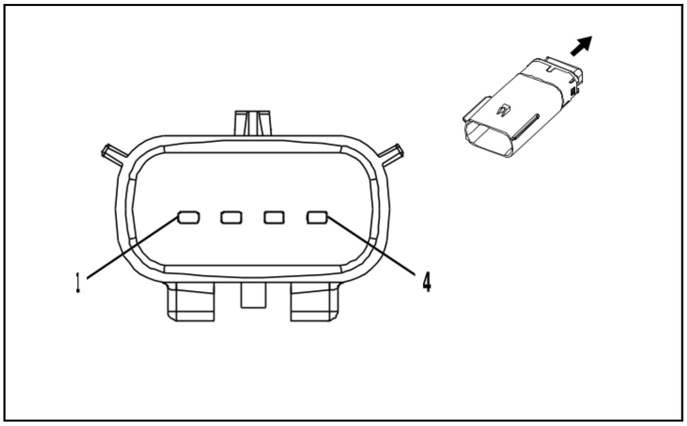
X340 Body Wiring Harness to Rear Seat Heater Control Wiring Harness (KA6)



4455251

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 15514524
- Service Connector: 19355605
- Description: 4-Way F 1.5 OCS Series, Sealed(BK)



2917338

Connector Part Information

- Harness Type: Rear Seat Heater Control Wiring Harness
- OEM Connector: 33481-4401
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.5 Series, Sealed(BK)

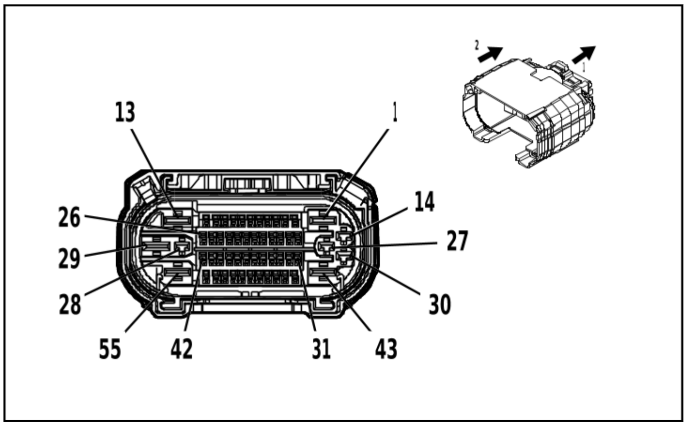
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-3 (GY)	No Tool Required

X340 Body Wiring Harness to Rear Seat Heater Control Wiring Harness (KA6)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) RD / WH	(1) 5740	(1) I	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 0.75	(1) RD / YE	(1) 5740	(1) II	(1) —
(2) 2	(2) 0.75	(2) RD / BU	(2) 6740	(2) I	(2) —	(2) Battery Positive Voltage	(2) 2	(2) 0.75	(2) RD / VT	(2) 6740	(2) II	(2) —
(3) 3	(3) 0.35	(3) GN / VT	(3) 2857	(3) I	(3) —	(3) Body Control Module LIN Bus 11	(3) 3	(3) 0.5	(3) GN / BU	(3) 6133	(3) II	(3) —
(4) 4	(4) 1	(4) BK	(4) 1550	(4) I	(4) —	(4) Ground	(4) 4	(4) 1	(4) BK	(4) 1150	(4) II	(4) —

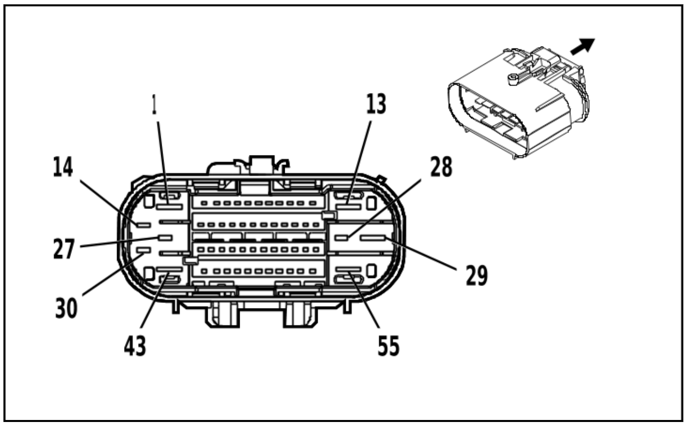
X360 Chassis Wiring Harness to Fuel Pump Power Control Module Harness



4992168

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 35016652
- Service Connector: 19371185
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)



4993301

Connector Part Information

- Harness Type: Fuel Pump Power Control Module Harness
- OEM Connector: 35205173
- Service Connector: Service by Harness - See Part Catalog
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19332901	J-35616-35 (VT)	J-38125-212
II	19370818	J-35616-12 (BU)	J-38125-553
III	84634921	J-35616-42 (RD)	J-38125-212
IV	Not required	J-35616-13 (BU)	No Tool Required
V	Not required	J-35616-32 (OG)	No Tool Required

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
VI	Not required	J-35616-34 (YE)	No Tool Required
VII	Not required	J-35616-5 (PU)	No Tool Required

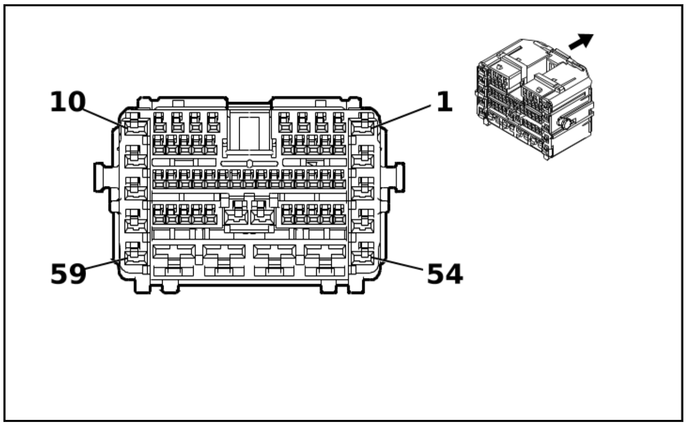
X360 Chassis Wiring Harness to Fuel Pump Power Control Module Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY	(1) 120	(1) III	(1) —	(1) Fuel Pump Control	(1) 1	(1) 2.5	(1) GY	(1) 120	(1) V	(1) —
(2) 2	(2) 0.75	(2) BU / GN	(2) 11437	(2) II	(2) —	(2) Secondary Fuel Pump Disable Signal	(2) 2	(2) 0.75	(2) BU / GN	(2) 11437	(2) VI	(2) —
3	—	—	—	—	—	Not Occupied	3	—	—	—	—	—
(4) 4	(4) 0.5	(4) BN / WH	(4) 7073	(4) II	(4) —	(4) Fuel Temperature Sensor 1 Low Reference	(4) 4	(4) 0.5	(4) BN / WH	(4) 7073	(4) IV	(4) —
5	—	—	—	—	—	Not Occupied	5	—	—	—	—	—
(6) 6	(6) 0.5	(6) VT / WH	(6) 639	(6) II	(6) —	(6) Run/ Crank Ignition 1 Voltage	(6) 6	(6) 0.5	(6) VT / WH	(6) 639	(6) IV	(6) —
7	—	—	—	—	—	Not Occupied	7	—	—	—	—	—
(8) 8	(8) 0.5	(8) BN / GY	(8) 7072	(8) II	(8) —	(8) Fuel Temperature Sensor 1 Signal	(8) 8	(8) 0.5	(8) BN / GY	(8) 7072	(8) IV	(8) —
9	—	—	—	—	—	Not Occupied	9	—	—	—	—	—
(10) 10	(10) 0.5	(10) GN / GY	(10) 465	(10) II	(10) —	(10) Fuel Pump Primary Relay Control	(10) 10	(10) 0.5	(10) GN / GY	(10) 465	(10) IV	(10) —
11	—	—	—	—	—	Not Occupied	11	—	—	—	—	—
(12) 12	(12) 0.75	(12) BU / GN	(12) 1936	(12) II	(12) —	(12) Primary Fuel Level Sensor Signal	(12) 12	(12) 0.75	(12) BU / GN	(12) 1936	(12) VI	(12) —
(13) 13	(13) 1	(13) BK / GN	(13) 1580	(13) III	(13) —	(13) Fuel Pump Low Reference	(13) 13	(13) 0.75	(13) BK / GN	(13) 1580	(13) V	(13) —
(14) 14	(14) 2.5	(14) RD / VT	(14) 1940	(14) I	(14) —	(14) Battery Positive Voltage	(14) 14	(14) 2.5	(14) RD / VT	(14) 1940	(14) VII	(14) —
15	—	—	—	—	—	Not Occupied	15	—	—	—	—	—
(16) 16	(16) 0.5	(16) BU / WH	(16) 1937	(16) II	(16) —	(16) Secondary Fuel Level Sensor Signal	(16) 16	(16) 0.5	(16) BU / WH	(16) 1937	(16) IV	(16) —
17	—	—	—	—	—	Not Occupied	17	—	—	—	—	—
(18) 18	(18) 0.5	(18) BK / GN	(18) 6281	(18) II	(18) —	(18) Fuel Level Sensor Low Reference	(18) 18	(18) 0.5	(18) BK / GN	(18) 6281	(18) IV	(18) —
19	—	—	—	—	—	Not Occupied	19	—	—	—	—	—
(20) 20	(20) 0.5	(20) BK / BU	(20) 6282	(20) II	(20) —	(20) Fuel Level Sensor 2 Low Reference	(20) 20	(20) 0.5	(20) BK / BU	(20) 6282	(20) IV	(20) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
21	—	—	—	—	—	Not Occupied	21	—	—	—	—	—
(22) 22	(22) 0.5	(22) BU / YE	(22) 6861	(22) II	(22) —	(22) Water In Fuel Sensor Signal	(22) 22	(22) 0.5	(22) BU / YE	(22) 6861	(22) IV	(22) —
23	—	—	—	—	—	Not Occupied	23	—	—	—	—	—
(24) 24	(24) 0.5	(24) BK / BU	(24) 6863	(24) II	(24) —	(24) Water In Fuel Sensor Low Reference	(24) 24	(24) 0.5	(24) BK / BU	(24) 6863	(24) IV	(24) —
25	—	—	—	—	—	Not Occupied	25	—	—	—	—	—
(26) 26	(26) 0.5	(26) BN / RD	(26) 7445	(26) II	(26) —	(26) Fuel Line Pressure Sensor 5V Reference	(26) 26	(26) 0.5	(26) BN / RD	(26) 7445	(26) IV	(26) —
(27) 27	(27) 1	(27) BU / GN	(27) 2120	(27) I	(27) —	(27) Secondary Fuel Pump Control	(27) 27	(27) 1	(27) BU / GN	(27) 2120	(27) VII	(27) —
(28) 28	(28) 2.5	(28) YE / GY	(28) 4137	(28) I	(28) —	(28) Fuel Pump Supply Voltage Phase 2	(28) 28	(28) 2.5	(28) YE / GY	(28) 4137	(28) VII	(28) —
(29) 29	(29) 0.75	(29) VT / GN	(29) 4320	(29) III	(29) —	(29) Powertrain Sensor Bus Enable	(29) 29	(29) 0.75	(29) VT / GN	(29) 4320	(29) V	(29) —
(30) 30	(30) 2.5	(30) WH / BN	(30) 4138	(30) I	(30) —	(30) Fuel Pump Supply Voltage Phase 3	(30) 30	(30) 2.5	(30) WH / BN	(30) 4138	(30) VII	(30) —
31 - 42	—	—	—	—	—	Not Occupied	31 - 42	—	—	—	—	—
(43) 43	(43) 2.5	(43) BK / WH	(43) 1951	(43) III	(43) —	(43) Signal Ground	(43) 43	(43) 2.5	(43) BK / WH	(43) 1951	(43) V	(43) —
(44) 44	(44) 0.75	(44) BU / WH	(44) 7446	(44) II	(44) —	(44) Fuel Pressure Sensor Signal	(44) 44	(44) 0.75	(44) BU / WH	(44) 7446	(44) VI	(44) —
45	—	—	—	—	—	Not Occupied	45	—	—	—	—	—
(46) 46	(46) 0.5	(46) BK / YE	(46) 7447	(46) II	(46) —	(46) Fuel Pressure Sensor Low Reference	(46) 46	(46) 0.5	(46) BK / YE	(46) 7447	(46) IV	(46) —
47 - 49	—	—	—	—	—	Not Occupied	47 - 49	—	—	—	—	—
(50) 50	(50) 0.5	(50) WH	(50) 4055	(50) II	(50) —	(50) Private Serial Data Powertrain CAN Bus [+] Serial Data	(50) 50	(50) 0.5	(50) WH	(50) 4055	(50) IV	(50) —
51	—	—	—	—	—	Not Occupied	51	—	—	—	—	—
(52) 52	(52) 0.5	(52) BU / GY	(52) 4054	(52) II	(52) —	(52) Private Serial Data Powertrain CAN Bus [-] Serial Data	(52) 52	(52) 0.5	(52) BU / GY	(52) 4054	(52) IV	(52) —
53	—	—	—	—	—	Not Occupied	53	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(54) 54	(54) 0.75	(54) WH	(54) 74 44	(54) II	(54) —	(54) Fuel Pump Assembly Shield Ground	(54) 54	(54) 0.75	(54) WH	(54) 74 44	(54) VI	(54) —
55	—	—	—	—	—	Not Occupied	55	—	—	—	—	—

X370A Dome Lamp Wiring Harness to Instrument Panel Wiring Harness



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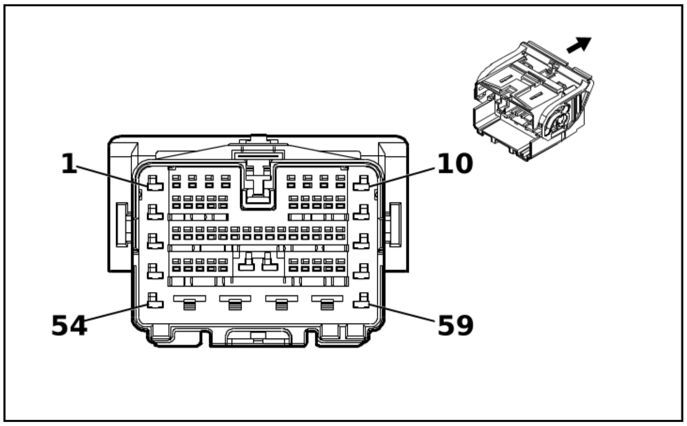

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Connector Part Information
- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 7289-7293-30
- Service Connector: 13528126
- Description: 59-Way F 1.2 MCON, 2.8, 6.3 YESC Series(BK)

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 7288-7295-30
- Service Connector: 84766292
- Description: 59-Way M 1.2 MCON, 2.8, 6.3 YESC Series(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19331733	J-35616-12 (BU)	J-38125-553
II	85544080	J-35616-4A (PU)	J-38125-11A
III	13578908	J-35616-5 (PU)	J-38125-11A
IV	19330704	J-35616-13 (BU)	J-38125-215A

X370A Dome Lamp Wiring Harness to Instrument Panel Wiring Harness

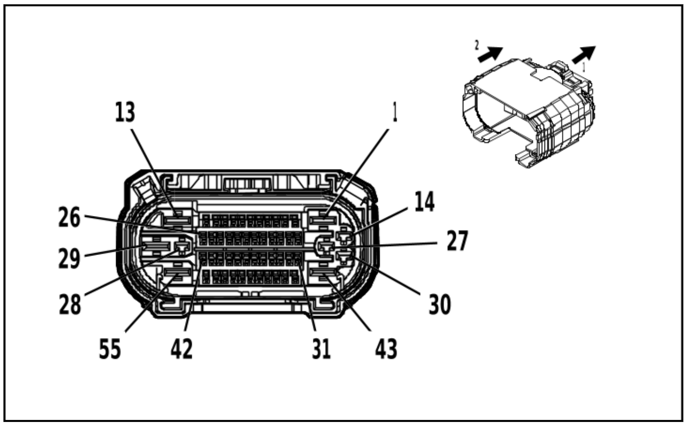
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / YE	(1) 240	(1) II	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 0.5	(1) RD / YE	(1) 240	(1) III	(1) —
(2) 2	(2) 0.5	(2) VT / BK	(2) 339	(2) I	(2) —	(2) Run/ Crank Ignition 1 Voltage	(2) 2	(2) 0.5	(2) VT / BK	(2) 339	(2) IV	(2) —
3	—	—	—	—	—	Not Occupied	3	—	—	—	—	—
(4) 4	(4) 0.35	(4) GN / BN	(4) 3005	(4) I	(4) —	(4) Active Noise Cancellation Microphone 1 Signal	(4) 4	(4) 0.35	(4) GN / BN	(4) 3005	(4) IV	(4) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(5) 5	(5) 0.35	(5) GN / BK	(5) 3008	(5) I	(5) —	(5) Active Noise Cancellation Microphone 1 Feedback Signal	(5) 5	(5) 0.35	(5) GN / BK	(5) 3008	(5) IV	(5) —
6 - 9	—	—	—	—	—	Not Occupied	6 - 9	—	—	—	—	—
(10) 10	(10) 0.35	(10) WH	(10) 4978	(10) II	(10) —	(10) AUTOSAR CAN Bus [-] 2 Serial Data	(10) 10	(10) 0.35	(10) WH	(10) 4978	(10) III	(10) —
(11) 11	(11) 0.35	(11) BU / YE	(11) 4979	(11) II	(11) —	(11) AUTOSAR CAN Bus [+] 2 Serial Data	(11) 11	(11) 0.35	(11) BU / YE	(11) 4979	(11) III	(11) —
(12) 12	(12) 0.35	(12) WH	(12) 4978	(12) I	(12) —	(12) AUTOSAR CAN Bus [-] 2 Serial Data	(12) 12	(12) 0.5	(12) WH	(12) 4978	(12) IV	(12) —
(13) 13	(13) 0.35	(13) BU / YE	(13) 4979	(13) I	(13) —	(13) AUTOSAR CAN Bus [+] 2 Serial Data	(13) 13	(13) 0.5	(13) BU / YE	(13) 4979	(13) IV	(13) —
(14) 14	(14) 0.35	(14) BK / BN	(14) 654	(14) I	(14) —	(14) Cellular Telephone Microphone Low Reference	(14) 14	(14) 0.35	(14) BK / BN	(14) 654	(14) IV	(14) —
(15) 15	(15) 0.35	(15) BU	(15) 655	(15) I	(15) —	(15) Cellular Telephone Microphone Signal	(15) 15	(15) 0.35	(15) BU	(15) 655	(15) IV	(15) —
(16) 16	(16) 0.35	(16) VT / YE	(16) 7043	(16) I	(16) —	(16) Microphone [+] Signal	(16) 16	(16) 0.35	(16) VT / YE	(16) 7043	(16) IV	(16) —
(17) 17	(17) 0.35	(17) BU / BK	(17) 7044	(17) I	(17) —	(17) Microphone [-] Signal	(17) 17	(17) 0.35	(17) BU / BK	(17) 7044	(17) IV	(17) —
(18) 18	(18) 0.5	(18) BU / BK	(18) 1053	(18) I	(18) —	(18) Center High Mounted Stop Lamp Control 3	(18) 18	(18) 0.5	(18) BU / BK	(18) 1053	(18) IV	(18) —
(19) 19	(19) 0.5	(19) WH / VT	(19) 1430	(19) I	(19) —	(19) Exterior Courtesy Lamp Control	(19) 19	(19) 0.5	(19) WH / VT	(19) 1430	(19) IV	(19) —
(20) 20	(20) 0.35	(20) YE / WH	(20) 1690	(20) I	(20) —	(20) Mirror Dimming Signal	(20) 20	(20) 0.35	(20) YE / WH	(20) 1690	(20) IV	(20) —
(21) 21	(21) 0.35	(21) BK / YE	(21) 1691	(21) I	(21) —	(21) Automatic Day/Night Mirror Low Reference	(21) 21	(21) 0.35	(21) BK / YE	(21) 1691	(21) IV	(21) —
(22) 22	(22) 0.35	(22) GN / WH	(22) 24	(22) II	(22) —	(22) Backup Lamp Control	(22) 22	(22) 0.35	(22) GN / WH	(22) 24	(22) III	(22) —
(23) 23	(23) 0.35	(23) GN / WH	(23) 2514	(23) II	(23) —	(23) Telematics Switch Signal	(23) 23	(23) 0.35	(23) GN / WH	(23) 2514	(23) III	(23) —
(24) 24	(24) 0.35	(24) GN / BK	(24) 2515	(24) I	(24) —	(24) Telematics Switch Supply Voltage	(24) 24	(24) 0.35	(24) GN / BK	(24) 2515	(24) IV	(24) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(25) 25	(25) 0.35	(25) YE / VT	(25) 2516	(25) I	(25) —	(25) Telematics Switch Green LED Indicator Control	(25) 25	(25) 0.35	(25) YE / VT	(25) 2516	(25) IV	(25) —
(26) 26	(26) 0.35	(26) BN / WH	(26) 2517	(26) I	(26) —	(26) Telematics Switch Red LED Indicator Control	(26) 26	(26) 0.35	(26) BN / WH	(26) 2517	(26) IV	(26) —
(27) 27	(27) 0.5	(27) GN / WH	(27) 2854	(27) I	(27) —	(27) Body Control Module LIN Bus 8	(27) 27	(27) 0.5	(27) GN / WH	(27) 2854	(27) IV	(27) —
(28) 28	(28) 0.35	(28) GN / WH	(28) 4115	(28) I	(28) —	(28) Body Control Module LIN Bus 5	(28) 28	(28) 0.35	(28) GN / WH	(28) 4115	(28) IV	(28) —
(29) 29	(29) 0.35	(29) YE / VT	(29) 6191	(29) I	(29) —	(29) Power Rear Window Switch Open Signal	(29) 29	(29) 0.5	(29) YE / VT	(29) 6191	(29) IV	(29) —
(30) 30	(30) 0.35	(30) WH	(30) 6192	(30) I	(30) —	(30) Sliding Rear Window Switch Close Signal	(30) 30	(30) 0.5	(30) WH	(30) 6192	(30) IV	(30) —
(31) 31	(31) 0.35	(31) YE	(31) 6817	(31) I	(31) —	(31) LED Backlight Dimming Control 1	(31) 31	(31) 0.35	(31) YE	(31) 6817	(31) IV	(31) —
(32) 32	(32) 0.5	(32) VT	(32) 801	(32) I	(32) —	(32) Retained Accessory Power Control	(32) 32	(32) 0.5	(32) VT	(32) 801	(32) IV	(32) —
(33) 33	(33) 0.5	(33) BN / YE	(33) 820	(33) I	(33) —	(33) Center High Mounted Stop Lamp Supply Voltage	(33) 33	(33) 0.5	(33) BN / YE	(33) 820	(33) IV	(33) —
(34) 34	(34) 0.35	(34) RD / WH	(34) 1340	(34) I	(34) —	(34) Battery Positive Voltage	(34) 34	(34) 0.35	(34) RD / WH	(34) 1340	(34) IV	(34) —
35	—	—	—	—	—	Not Occupied	35	—	—	—	—	—
(36) 36	(36) 0.35	(36) BK / WH	(36) 851	(36) I	(36) —	(36) Signal Ground	(36) 36	(36) 0.5	(36) BK / WH	(36) 851	(36) IV	(36) —
37 - 38	—	—	—	—	—	Not Occupied	37 - 38	—	—	—	—	—
(39) 39	(39) 2.5	(39) VT / BU	(39) 10735	(39) II	(39) —	(39) Upfitter Accessory 5 Supply Voltage	(39) 39	(39) 2.5	(39) VT / BU	(39) 10735	(39) III	(39) —
(40) 40	(40) 2.5	(40) BK	(40) 1050	(40) II	(40) —	(40) Ground	(40) 40	(40) 2.5	(40) BK	(40) 1050	(40) III	(40) —
41 - 52	—	—	—	—	—	Not Occupied	41 - 52	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(53) 53	(53) 2.5	(53) RD / BU	(53) 4540	(53) II	(53) —	(53) Battery Positive Voltage	(53) 53	(53) 2.5	(53) RD / BU	(53) 4540	(53) III	(53) —
54 - 59	—	—	—	—	—	Not Occupied	54 - 59	—	—	—	—	—

X370B Dome Lamp Wiring Harness to Instrument Panel Wiring Harness



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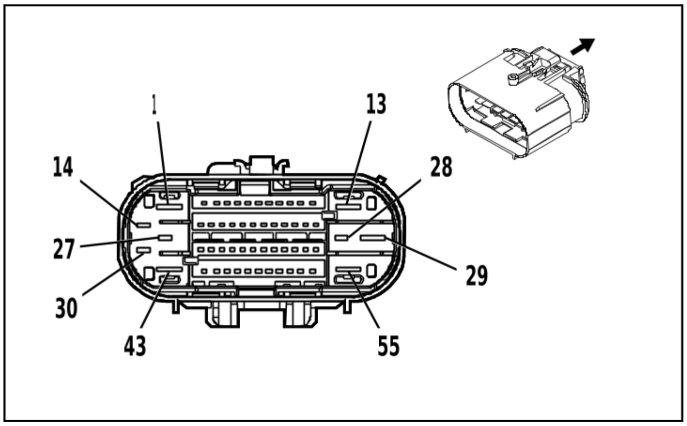

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Connector Part Information
- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 35605245
- Service Connector: 19371185
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Connector Part Information
- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 35664005
- Service Connector: 84727364
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19332901	J-35616-35 (VT)	J-38125-212
II	19370818	J-35616-12 (BU)	J-38125-553
III	84634921	J-35616-42 (RD)	J-38125-212
IV	84847992	J-35616-32 (OG)	J-38125-36
V	84867140	J-35616-13 (BU)	J-38125-553
VI	84992391	J-35616-5 (PU)	J-38125-36

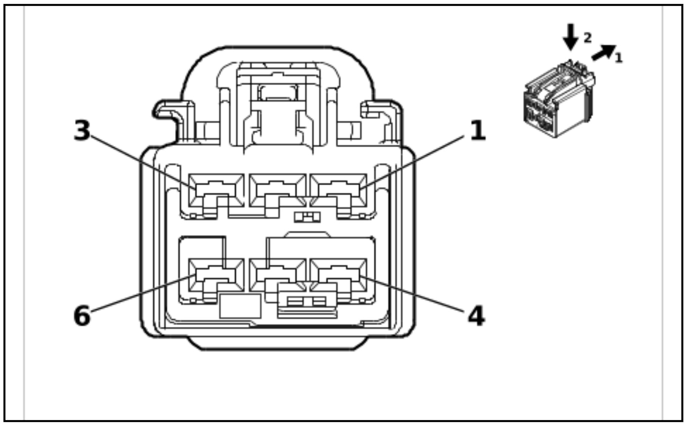
X370B Dome Lamp Wiring Harness to Instrument Panel Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / YE	(1) 240	(1) III	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 0.5	(1) RD / YE	(1) 240	(1) IV	(1) —
2	—	—	—	—	—	Not Occupied	2	—	—	—	—	—
(3) 3	(3) 0.5	(3) VT / BK	(3) 339	(3) II	(3) —	(3) Run/ Crank Ignition 1 Voltage	(3) 3	(3) 0.5	(3) VT / BK	(3) 339	(3) V	(3) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(4) 4	(4) 0.35	(4) WH	(4) 4978	(4) II	(4) —	(4) AUTOSAR CAN Bus [-] 2 Serial Data	(4) 4	(4) 0.35	(4) WH	(4) 4978	(4) V	(4) —
(5) 5	(5) 0.35	(5) BU / YE	(5) 4979	(5) II	(5) —	(5) AUTOSAR CAN Bus [+] 2 Serial Data	(5) 5	(5) 0.35	(5) BU / YE	(5) 4979	(5) V	(5) —
(6) 6	(6) 0.35	(6) BK / BN	(6) 654	(6) II	(6) —	(6) Cellular Telephone Microphone Low Reference	(6) 6	(6) 0.35	(6) BK / BN	(6) 654	(6) V	(6) —
(7) 7	(7) 0.35	(7) BU	(7) 655	(7) II	(7) —	(7) Cellular Telephone Microphone Signal	(7) 7	(7) 0.35	(7) BU	(7) 655	(7) V	(7) —
(8) 8	(8) 0.5	(8) BU / BK	(8) 1053	(8) II	(8) —	(8) Center High Mounted Stop Lamp Control 3	(8) 8	(8) 0.5	(8) BU / BK	(8) 1053	(8) V	(8) —
(9) 9	(9) 0.5	(9) WH / VT	(9) 1430	(9) II	(9) —	(9) Exterior Courtesy Lamp Control	(9) 9	(9) 0.5	(9) WH / VT	(9) 1430	(9) V	(9) —
10 - 14	—	—	—	—	—	Not Occupied	10 - 14	—	—	—	—	—
(15) 15	(15) 0.5	(15) GN / WH	(15) 2854	(15) II	(15) —	(15) Body Control Module LIN Bus 8	(15) 15	(15) 0.5	(15) GN / WH	(15) 2854	(15) V	(15) —
16	—	—	—	—	—	Not Occupied	16	—	—	—	—	—
(17) 17	(17) 0.5	(17) BN / YE	(17) 820	(17) II	(17) —	(17) Center High Mounted Stop Lamp Supply Voltage	(17) 17	(17) 0.5	(17) BN / YE	(17) 820	(17) V	(17) —
18 - 19	—	—	—	—	—	Not Occupied	18 - 19	—	—	—	—	—
(20) 20	(20) 0.35	(20) YE / WH	(20) 1690	(20) II	(20) —	(20) Mirror Dimming Signal	(20) 20	(20) 0.35	(20) YE / WH	(20) 1690	(20) V	(20) —
(21) 21	(21) 0.35	(21) BK / YE	(21) 1691	(21) II	(21) —	(21) Automatic Day/Night Mirror Low Reference	(21) 21	(21) 0.35	(21) BK / YE	(21) 1691	(21) V	(21) —
(22) 22	(22) 0.35	(22) GN / WH	(22) 24	(22) II	(22) —	(22) Backup Lamp Control	(22) 22	(22) 0.35	(22) GN / WH	(22) 24	(22) V	(22) —
(23) 23	(23) 0.35	(23) GN / WH	(23) 2514	(23) II	(23) —	(23) Telematics Switch Signal	(23) 23	(23) 0.35	(23) GN / WH	(23) 2514	(23) V	(23) —
(24) 24	(24) 0.35	(24) GN / BK	(24) 2515	(24) II	(24) —	(24) Telematics Switch Supply Voltage	(24) 24	(24) 0.35	(24) GN / BK	(24) 2515	(24) V	(24) —
(25) 25	(25) 0.35	(25) YE / VT	(25) 2516	(25) II	(25) —	(25) Telematics Switch Green LED Indicator Control	(25) 25	(25) 0.35	(25) YE / VT	(25) 2516	(25) V	(25) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(26) 26	(26) 0.35	(26) BN / WH	(26) 2517	(26) II	(26) —	(26) Telematics Switch Red LED Indicator Control	(26) 26	(26) 0.35	(26) BN / WH	(26) 2517	(26) V	(26) —
(27) 27	(27) 2.5	(27) BK	(27) 1050	(27) I	(27) —	(27) Ground	(27) 27	(27) 2.5	(27) BK	(27) 1050	(27) VI	(27) —
(28) 28	(28) 2.5	(28) VT / BU	(28) 10735	(28) I	(28) —	(28) Upfitter Accessory 5 Supply Voltage	(28) 28	(28) 2.5	(28) VT / BU	(28) 10735	(28) VI	(28) —
29 - 35	—	—	—	—	—	Not Occupied	29 - 35	—	—	—	—	—
(36) 36	(36) 0.35	(36) BK / WH	(36) 851	(36) II	(36) —	(36) Signal Ground	(36) 36	(36) 0.5	(36) BK / WH	(36) 851	(36) V	(36) —
37 - 45	—	—	—	—	—	Not Occupied	37 - 45	—	—	—	—	—
(46) 46	(46) 0.35	(46) WH	(46) 4978	(46) II	(46) —	(46) AUTOSAR CAN Bus [-] 2 Serial Data	(46) 46	(46) 0.35	(46) WH	(46) 4978	(46) V	(46) —
(47) 47	(47) 0.35	(47) BU / YE	(47) 4979	(47) II	(47) —	(47) AUTOSAR CAN Bus [+] 2 Serial Data	(47) 47	(47) 0.35	(47) BU / YE	(47) 4979	(47) V	(47) —
48 - 55	—	—	—	—	—	Not Occupied	48 - 55	—	—	—	—	—

X371A Inside Rearview Mirror Wiring Harness to Dome Lamp Wiring Harness



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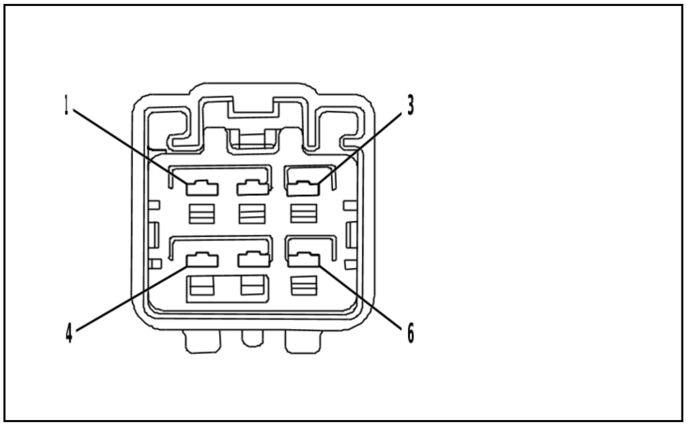

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Connector Part Information

- Harness Type: Inside Rearview Mirror Wiring Harness
- OEM Connector: 7289-7238-40
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F 2.8 YESC Series(GY)

Connector Part Information

- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 7282-6466-40
- Service Connector: 84727361
- Description: 6-Way M Kaizen Series(L-GY)

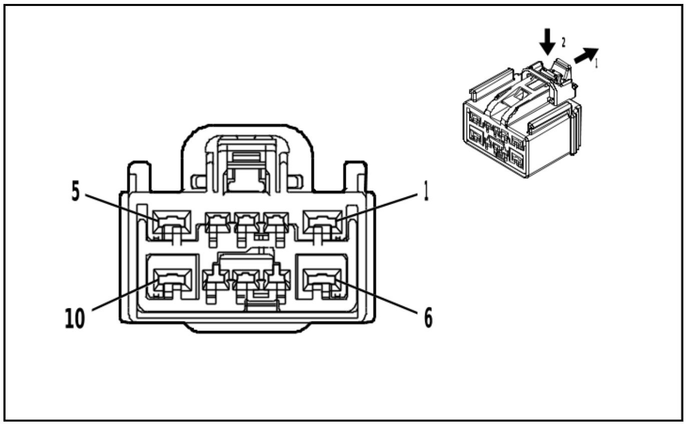
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required
II	Not required	J-35616-5 (PU)	No Tool Required

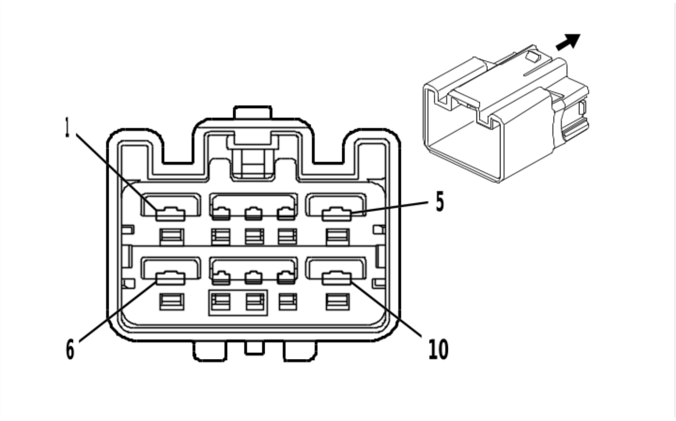
X371A Inside Rearview Mirror Wiring Harness to Dome Lamp Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH / VT	(1) 1430	(1) I	(1) —	(1) Exterior Courtesy Lamp Control	(1) 1	(1) 0.5	(1) WH / VT	(1) 1430	(1) II	(1) —
(2) 2	(2) 0.5	(2) BN / YE	(2) 820	(2) I	(2) —	(2) Center High Mounted Stop Lamp Supply Voltage	(2) 2	(2) 0.5	(2) BN / YE	(2) 820	(2) II	(2) —
(3) 3	(3) 0.5	(3) BK	(3) 1050	(3) I	(3) —	(3) Ground	(3) 3	(3) 1	(3) BK	(3) 1050	(3) II	(3) —
(4) 4	(4) 2.5	(4) BK	(4) 1050	(4) I	(4) —	(4) Ground	(4) 4	(4) 2.5	(4) BK	(4) 1050	(4) II	(4) —
(5) 5	(5) 2.5	(5) VT / BU	(5) 10735	(5) I	(5) —	(5) Upfitter Accessory 5 Supply Voltage	(5) 5	(5) 2.5	(5) VT / BU	(5) 10735	(5) II	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—

X371A_UVO Inside Rearview Mirror Wiring Harness to Dome Lamp Wiring Harness



5020939



1851890

Connector Part Information
- Harness Type: Inside Rearview Mirror Wiring Harness
- OEM Connector: 7289-9153-40
- Service Connector: Service by Harness - See Part Catalog
- Description: 10-Way F 1.5, 2.8 Kaizen Series(L-GY)

Connector Part Information
- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 7282-6459-40
- Service Connector: 89047070
- Description: 10-Way M 1.5, 2.8 Kaizen Series(L-GY)

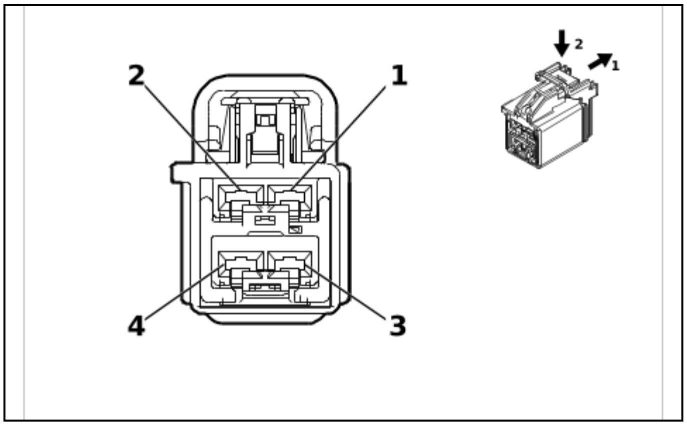
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required
III	13578907	J-35616-3 (GY)	J-38125-215A
IV	13578908	J-35616-5 (PU)	J-38125-11A

X371A_UVO Inside Rearview Mirror Wiring Harness to Dome Lamp Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GN / BU	(1) 10735	(1) II	(1) —	(1) Upfitter Accessory 5 Supply Voltage	(1) 1	(1) 2.5	(1) VT / BU	(1) 10735	(1) IV	(1) —
(2) 2	(2) 0.35	(2) BN / YE	(2) 820	(2) I	(2) —	(2) Center High Mounted Stop Lamp Supply Voltage	(2) 2	(2) 0.5	(2) BN / YE	(2) 820	(2) III	(2) —
(3) 3	(3) 0.35	(3) BK	(3) 1050	(3) I	(3) —	(3) Ground	(3) 3	(3) 1	(3) BK	(3) 1050	(3) III	(3) —
(4) 4	(4) 0.35	(4) WH / VT	(4) 1430	(4) I	(4) —	(4) Exterior Courtesy Lamp Control	(4) 4	(4) 0.5	(4) WH / VT	(4) 1430	(4) III	(4) —
(5) 5	(5) 2.5	(5) BK	(5) 1050	(5) II	(5) —	(5) Ground	(5) 5	(5) 2.5	(5) BK	(5) 1050	(5) IV	(5) —
(6) 6	(6) 0.35	(6) VT / GN	(6) 339	(6) II	(6) —	(6) Run/ Crank Ignition 1 Voltage	(6) 6	(6) 0.35	(6) VT / BK	(6) 339	(6) IV	(6) —
(7) 7	(7) 0.35	(7) WH / BU	(7) 6973	(7) I	(7) —	(7) Rearview Camera Signal [-]	(7) 7	(7) 0.35	(7) WH / BU	(7) 6973	(7) III	(7) —
(8) 8	(8) 0.35	(8) GY / YE	(8) 6972	(8) I	(8) —	(8) Rearview Camera Signal [+]	(8) 8	(8) 0.35	(8) GY / YE	(8) 6972	(8) III	(8) —
(9) 9	(9) 0.35	(9) BARE	(9) 6974	(9) I	(9) —	(9) Rearview Camera Low Reference	(9) 9	(9) 0.35	(9) BARE	(9) 6974	(9) III	(9) —
(10) 10	(10) 0.35	(10) BK / WH	(10) 851	(10) II	(10) —	(10) Signal Ground	(10) 10	(10) 0.35	(10) BK / WH	(10) 851	(10) IV	(10) —

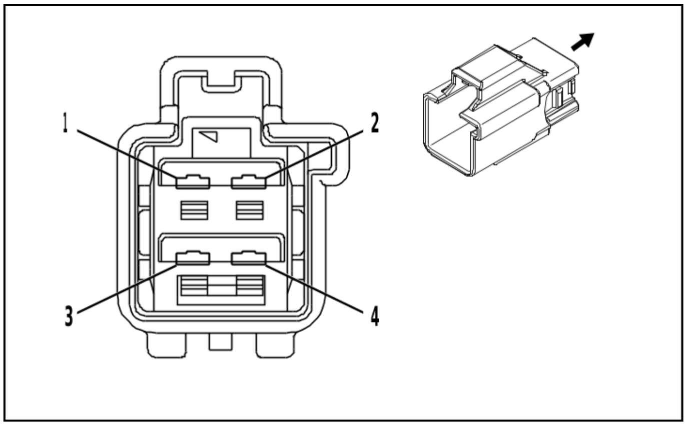
X375 Sunroof Wiring Harness to Dome Lamp Wiring Harness



5515744

Connector Part Information

- Harness Type: Sunroof Wiring Harness
- OEM Connector: 7289-7224-40
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 2.8 YESC Series(GY)



4257143

Connector Part Information

- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 7282-6446-40
- Service Connector: 89046843
- Description: 4-Way M 2.8 YESC Series(GY)

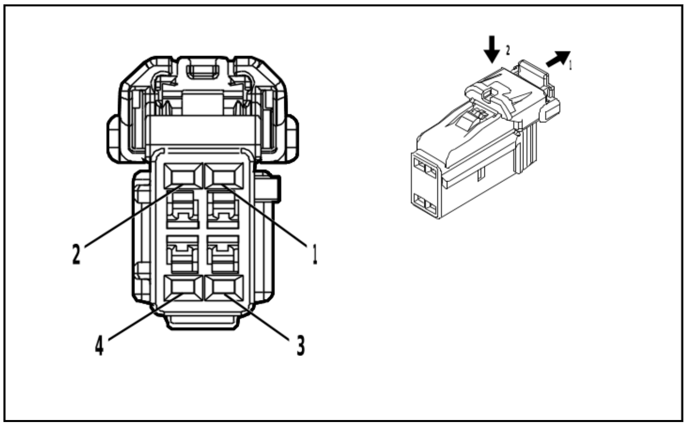
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-4A (PU)	No Tool Required
II	Not required	J-35616-5 (PU)	No Tool Required

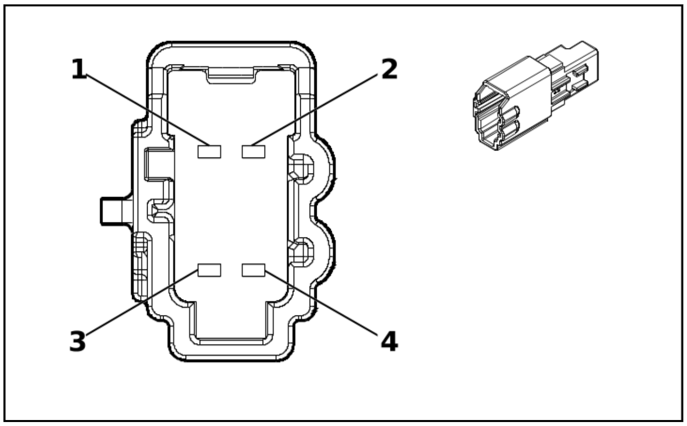
X375 Sunroof Wiring Harness to Dome Lamp Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 1.5	(1) BK	(1) 1050	(1) I	(1) —	(1) Ground	(1) 1	(1) 2.5	(1) BK	(1) 1050	(1) II	(1) —
(2) 2	(2) 0.35	(2) GY / BN	(2) 2854	(2) I	(2) —	(2) Body Control Module LIN Bus 8	(2) 2	(2) 0.5	(2) GN / BN	(2) 2854	(2) II	(2) —
3	—	—	—	—	—	Not Occupied	3	—	—	—	—	—
(4) 4	(4) 1.5	(4) RD / GY	(4) 4540	(4) I	(4) —	(4) Battery Positive Voltage	(4) 4	(4) 2.5	(4) RD / BU	(4) 4540	(4) II	(4) —

X382 Windshield Outside Moisture_Ambient Light and Humidity Sensor to Dome Lamp Wiring Harness



4872683



5360963

Connector Part Information
- Harness Type: Windshield Outside Moisture_Ambient Light and Humidity Sensor
- OEM Connector: 6098-8435
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 1.2 Series(BK)

Connector Part Information
- Harness Type: Dome Lamp Wiring Harness
- OEM Connector: 6098-9046
- Service Connector: 84847258
- Description: 4-Way M 1.2 MCON Series(BK)

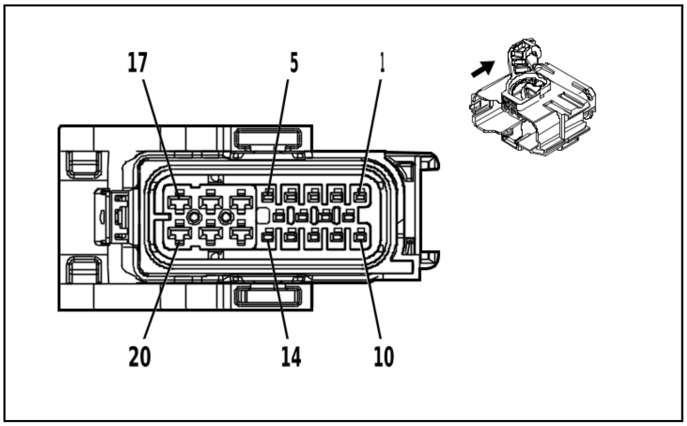
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-13 (BU)	No Tool Required

X382 Windshield Outside Moisture_Ambient Light and Humidity Sensor to Dome Lamp Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) RD / WH	(1) 1340	(1) I	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 0.35	(1) RD / WH	(1) 1340	(1) II	(1) —
(2) 2	(2) 0.35	(2) GN / BN	(2) 4115	(2) I	(2) —	(2) Body Control Module LIN Bus 5	(2) 2	(2) 0.35	(2) GN / WH	(2) 4115	(2) II	(2) —
(3) 3	(3) 0.35	(3) BK	(3) 1050	(3) I	(3) —	(3) Ground	(3) 3	(3) 0.35	(3) BK	(3) 1050	(3) II	(3) —
4	—	—	—	—	—	Not Occupied	4	—	—	—	—	—

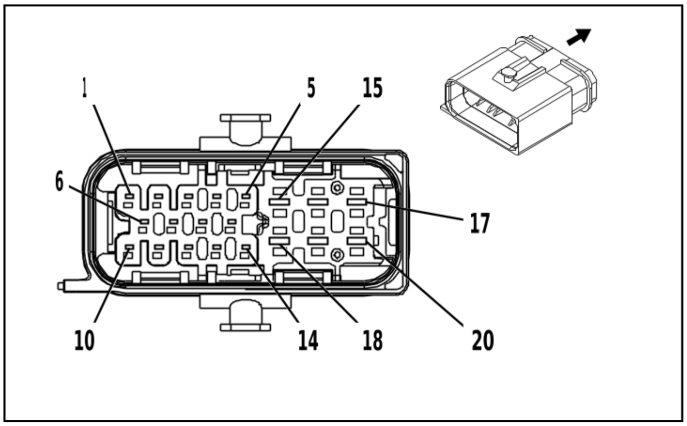
X401 Chassis Wiring Harness to Engine Wiring Harness



4994285

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13974124
- Service Connector: 19371189
- Description: 20-Way F 1.2 MCON, 2.8 MCP Series, Sealed(BK)



4500420

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 33156041
- Service Connector: 19333031
- Description: 20-Way M 1.2, 2.8 MCP Series, Sealed(BK)

Terminal Part Information

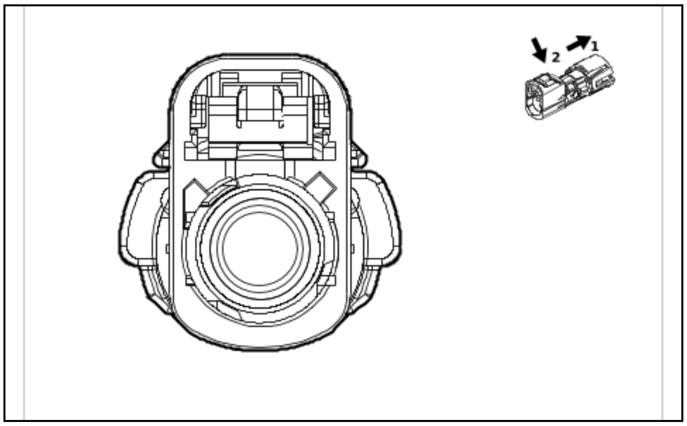
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19368624	J-35616-35 (VT)	J-38125-556
II	85669160	J-35616-12 (BU)	J-38125-215A
III	13575364	J-35616-5 (PU)	J-38125-36
IV	19356519	J-35616-13 (BU)	J-38125-215A

X401 Chassis Wiring Harness to Engine Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) WH	(1) 4055	(1) II	(1) —	(1) Private Serial Data Powertrain CAN Bus [+] Serial Data	(1) 1	(1) 0.5	(1) WH	(1) 4055	(1) IV	(1) —
(2) 2	(2) 0.5	(2) BU / GY	(2) 4054	(2) II	(2) —	(2) Private Serial Data Powertrain CAN Bus [-] Serial Data	(2) 2	(2) 0.5	(2) BU / GY	(2) 4054	(2) IV	(2) —
(3) 3	(3) 0.5	(3) GN / GY	(3) 465	(3) II	(3) —	(3) Fuel Pump Primary Relay Control	(3) 3	(3) 0.5	(3) GN / GY	(3) 465	(3) IV	(3) —
(4) 4	(4) 0.5 (4) 1	(4) WH / RD (4) BK / WH	(4) 11031 (4) 1151	(4) II (4) II	(4) — (4) —	(4) Fuel Tank Isolation Valve Supply Voltage (4) Signal Ground	(4) 4	(4) 0.5 (4) 0.75	(4) WH / RD (4) BK / WH	(4) 11031 (4) 1151	(4) IV (4) IV	(4) — (4) —
(5) 5	(5) 0.5 (5) 0.5	(5) BU (5) VT / BU	(5) 10290 (5) 5294	(5) II (5) II	(5) — (5) —	(5) Exhaust Gas Temperature Sensor SENT 2 Signal (5) Powertrain Main Relay Fused Supply Voltage 5	(5) 5	(5) 0.5 (5) 0.5	(5) BU (5) VT / BU	(5) 10290 (5) 5294	(5) IV (5) IV	(5) — (5) —
(6) 6	(6) 0.5 (6) 0.75	(6) BU / GN (6) BU / GN	(6) 11437 (6) 11437	(6) II (6) II	(6) — (6) —	(6) Secondary Fuel Pump Disable Signal (6) Secondary Fuel Pump Disable Signal	(6) 6	(6) 0.5	(6) BU / GN	(6) 11437	(6) IV	(6) —
(7) 7	(7) 0.5 (7) 1	(7) BK / GY (7) WH / RD	(7) 626 (7) 480	(7) II (7) II	(7) — (7) —	(7) Engine Control Vehicle Sensors Low Reference 1 (7) Engine Control Vehicle Sensors 5 Volt Reference 1	(7) 7	(7) 0.5 (7) 0.5	(7) BK / GY (7) WH / RD	(7) 626 (7) 480	(7) IV (7) IV	(7) — (7) —
(8) 8	(8) 0.5 (8) 1	(8) YE / GY (8) WH / BN	(8) 11029 (8) 2363	(8) II (8) II	(8) — (8) —	(8) Canister Vapor Pressure Sensor Signal (8) Exhaust Pressure Sensor SENT 1 Signal	(8) 8	(8) 0.5 (8) 0.5	(8) YE / GY (8) WH / BN	(8) 11029 (8) 2363	(8) IV (8) IV	(8) — (8) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(9) 9	(9) 0.5 (9) 1	(9) WH / RD (9) BK / GY	(9) 480 (9) 626	(9) II (9) II	(9) — (9) —	(9) Engine Control Vehicle Sensors 5 Volt Reference 1 (9) Engine Control Vehicle Sensors Low Reference 1	(9) 9	(9) 0.5 (9) 0.5	(9) WH / RD (9) BK / GY	(9) 480 (9) 626	(9) IV (9) IV	(9) — (9) —
(10) 10	(10) 0.5	(10) YE	(10) 10291	(10) II	(10) —	(10) Exhaust Gas Temperature Sensor SENT 3 Signal	(10) 10	(10) 0.5	(10) YE	(10) 10291	(10) IV	(10) —
(11) 11	(11) 0.5	(11) BN / BU	(11) 2926	(11) II	(11) —	(11) Exhaust Aftertreatment Fuel Injector High Control	(11) 11	(11) 0.5	(11) BN / BU	(11) 2926	(11) IV	(11) —
(12) 12	(12) 0.5	(12) VT / BN	(12) 2927	(12) II	(12) —	(12) Exhaust Aftertreatment Fuel Injector Low Control	(12) 12	(12) 0.5	(12) VT / BN	(12) 2927	(12) IV	(12) —
(13) 13	(13) 0.5	(13) YE / RD	(13) 10595	(13) II	(13) —	(13) Engine Control Vehicle Sensors 5 Volt Reference 2	(13) 13	(13) 0.5	(13) YE / RD	(13) 10595	(13) IV	(13) —
(14) 14	(14) —	(14) —	(14) —	(14) —	(14) —	(14) Powertrain Main Relay Fused Supply Voltage 4	(14) 14	(14) 0.75	(14) VT / BU	(14) 5293	(14) IV	(14) —
(15) 15	(15) 0.5 (15) 1.5	(15) VT / GN (15) VT / GN	(15) 4320 (15) 4320	(15) I (15) I	(15) — (15) —	(15) Powertrain Sensor Bus Enable (15) Powertrain Sensor Bus Enable	(15) 15	(15) 0.5 (15) 1.5	(15) VT / GN (15) VT / GN	(15) 4320 (15) 4320	(15) III (15) III	(15) — (15) —
(16) 16	(16) 0.5	(16) BU / BK	(16) 4977	(16) I	(16) —	(16) AUTOSAR CAN Bus [+] 3 Serial Data	(16) 16	(16) 0.5	(16) BU / BK	(16) 4977	(16) III	(16) —
(17) 17	(17) 0.5	(17) WH	(17) 4976	(17) I	(17) —	(17) AUTOSAR CAN Bus [-] 3 Serial Data	(17) 17	(17) 0.5	(17) WH	(17) 4976	(17) III	(17) —
18	—	—	—	—	—	Not Occupied	18	—	—	—	—	—
(19) 19	(19) 0.5	(19) BU / YE	(19) 4979	(19) I	(19) —	(19) AUTOSAR CAN Bus [+] 2 Serial Data	(19) 19	(19) 0.5	(19) BU / YE	(19) 4979	(19) III	(19) —
(20) 20	(20) 0.5	(20) WH	(20) 4978	(20) I	(20) —	(20) AUTOSAR CAN Bus [-] 2 Serial Data	(20) 20	(20) 0.5	(20) WH	(20) 4978	(20) III	(20) —

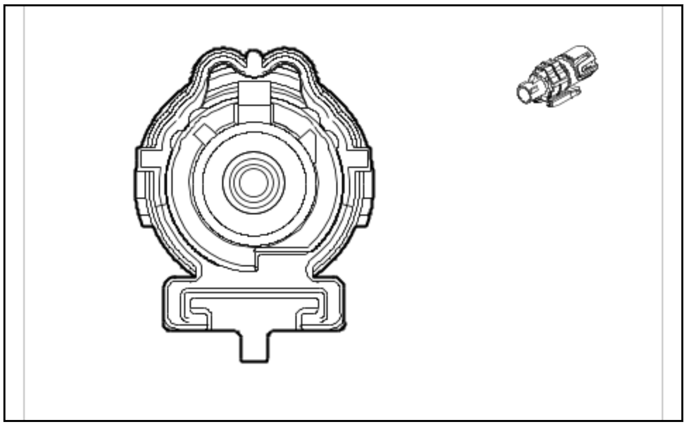
X402A Body Wiring Harness to Chassis Wiring Harness



5810829

Connector Part Information

- Harness Type: Body Wiring Harness COAX
- OEM Connector: 35187033
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(WH)



5757466

Connector Part Information

- Harness Type: Chassis Wiring Harness COAX
- OEM Connector: 33338240
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way M Coax Type, Sealed(WH)

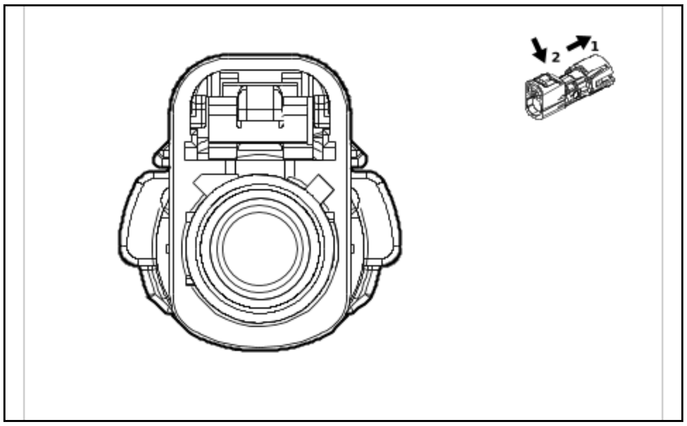
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

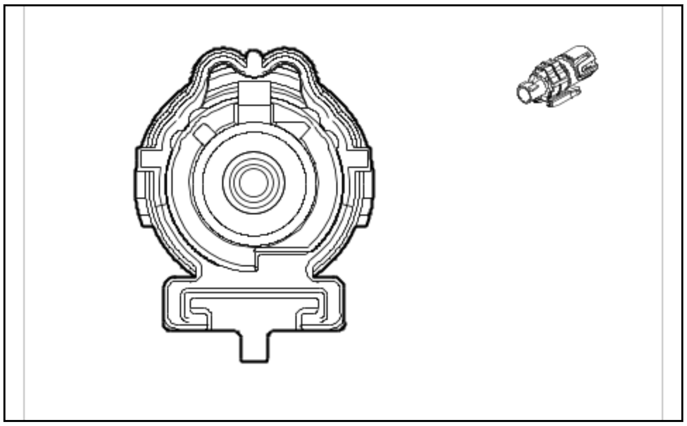
X402A Body Wiring Harness to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
—	—	Coax Cable	—	I	—	Trailer 2 Rear Vision Camera Coaxial Video Signal	—	—	Coax Cable	—	I	—

X402B Body Wiring Harness to Chassis Wiring Harness



5758030



5758019

Connector Part Information

- Harness Type: Body Wiring Harness COAX
- OEM Connector: 35187032
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BK)

Connector Part Information

- Harness Type: Chassis Wiring Harness COAX
- OEM Connector: 33338239
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way M Coax Type, Sealed(BK)

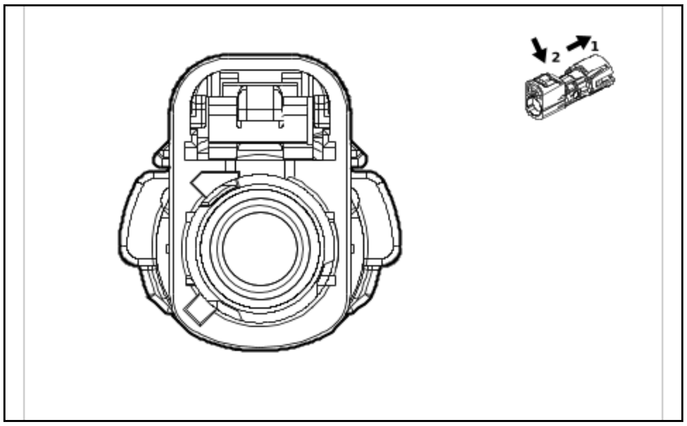
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X402B Body Wiring Harness to Chassis Wiring Harness

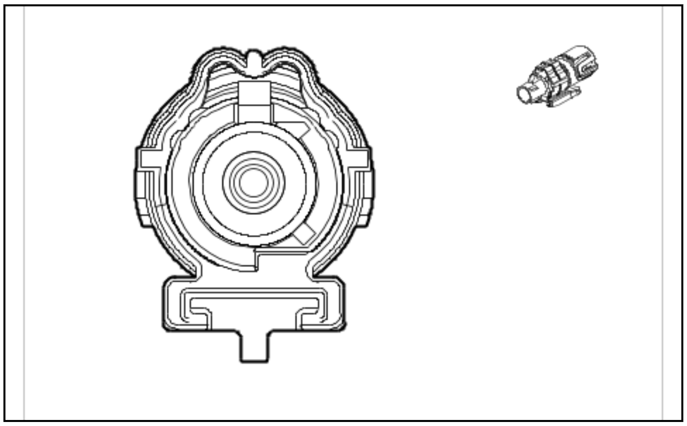
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
—	—	Coax Cable	—	I	—	Trailer Rear Vision Camera Coaxial Video Signal	—	—	Coax Cable	—	I	—

X402C Body Wiring Harness to Chassis Wiring Harness



5810838

Connector Part Information
- Harness Type: Body Wiring Harness COAX
- OEM Connector: 35187037
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(BN)



5758017

Connector Part Information
- Harness Type: Chassis Wiring Harness COAX
- OEM Connector: 33338245
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way M Coax Type, Sealed(BN)

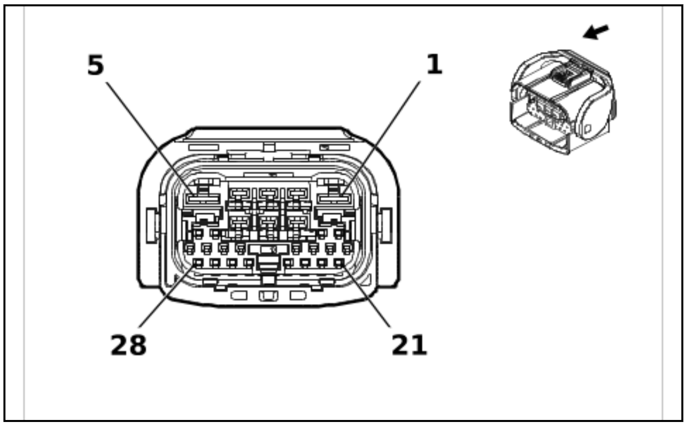
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

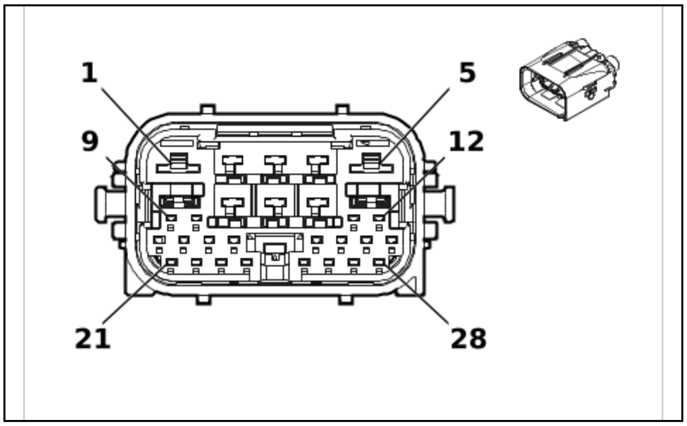
X402C Body Wiring Harness to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
—	—	Coax Cable	—	I	—	Rear Vision Camera Coaxial Video Signal	—	—	Coax Cable	—	I	—

X404 Chassis Wiring Harness to Emission Reduction Fluid Tank Reservoir Wire Harness



6572042



6757546

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 7298-4827-30
- Service Connector: 85761013
- Description: 28-Way F 1.2 MLK, 2.8, 6.3 YESC Series(BK)

Connector Part Information

- Harness Type: Emission Reduction Fluid Tank Reservoir Wire Harness
- OEM Connector: 7297-4839-30
- Service Connector: Service by Harness - See Part Catalog
- Description: 28-Way M 1.2 MLK, 2.8, 6.3 YESC Series(BK)

Terminal Part Information

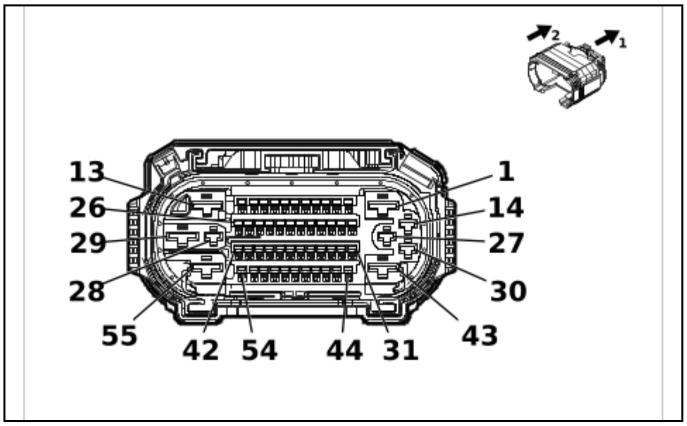
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	13575383	J-35616-42 (RD)	J-38125-11A
II	19368324	J-35616-35 (VT)	J-38125-11A
III	85669160	J-35616-12 (BU)	J-38125-215A
IV	Not required	J-35616-17 (L-GN)	No Tool Required
V	Not required	J-35616-5 (PU)	No Tool Required

X404 Chassis Wiring Harness to Emission Reduction Fluid Tank Reservoir Wire Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) RD / WH	(1) 2040	(1) I	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 3	(1) RD / WH	(1) 2040	(1) V	(1) —
2 - 4	—	—	—	—	—	Not Occupied	2 - 4	—	—	—	—	—
(5) 5	(5) 3	(5) BK / WH	(5) 1151	(5) I	(5) —	(5) Signal Ground	(5) 5	(5) 3	(5) BK / WH	(5) 1151	(5) V	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—
(7) 7	(7) 1.5	(7) RD / GN	(7) 2440	(7) II	(7) —	(7) Battery Positive Voltage	(7) 7	(7) 2	(7) RD / GN	(7) 2440	(7) V	(7) —
8 - 14	—	—	—	—	—	Not Occupied	8 - 14	—	—	—	—	—
(15) 15	(15) 0.5	(15) VT / WH	(15) 639	(15) III	(15) —	(15) Run/ Crank Ignition 1 Voltage	(15) 15	(15) 0.5	(15) VT / WH	(15) 639	(15) IV	(15) —
(16) 16	(16) 0.5	(16) BU	(16) 4977	(16) III	(16) —	(16) AUTOSAR CAN Bus [+] 3 Serial Data	(16) 16	(16) 0.5	(16) BU / BK	(16) 4977	(16) IV	(16) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(17) 17	(17) 0.5	(17) BU	(17) 4977	(17) III	(17) —	(17) AUTOSAR CAN Bus [+] 3 Serial Data	(17) 17	(17) 0.5	(17) BU / BK	(17) 4977	(17) IV	(17) —
18 - 23	—	—	—	—	—	Not Occupied	18 - 23	—	—	—	—	—
(24) 24	(24) 0.5	(24) BN	(24) 4976	(24) III	(24) —	(24) AUTOSAR CAN Bus [-] 3 Serial Data	(24) 24	(24) 0.5	(24) WH	(24) 4976	(24) IV	(24) —
(25) 25	(25) 0.5	(25) BN	(25) 4976	(25) III	(25) —	(25) AUTOSAR CAN Bus [-] 3 Serial Data	(25) 25	(25) 0.5	(25) WH	(25) 4976	(25) IV	(25) —
26 - 28	—	—	—	—	—	Not Occupied	26 - 28	—	—	—	—	—

X410 Body Wiring Harness to Chassis Wiring Harness



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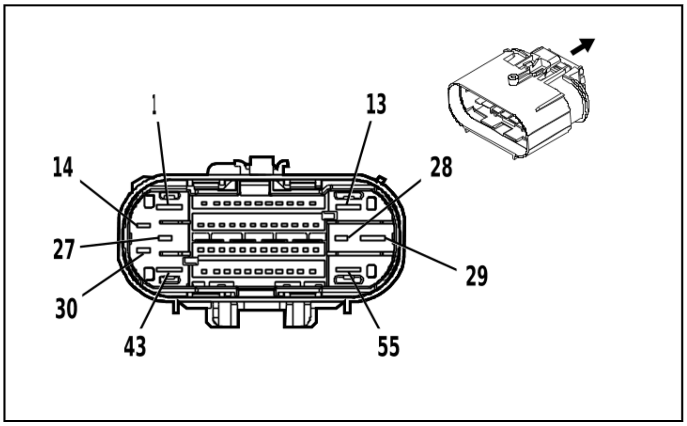


4993301

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 35588033
- Service Connector: 19371185
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 35588063
- Service Connector: 84727364
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19332901	J-35616-35 (VT)	J-38125-212
II	19370818	J-35616-12 (BU)	J-38125-553
III	84634921	J-35616-42 (RD)	J-38125-212
IV	84847992	J-35616-32 (OG)	J-38125-36
V	84867140	J-35616-13 (BU)	J-38125-553
VI	84992391	J-35616-5 (PU)	J-38125-36

X410 Body Wiring Harness to Chassis Wiring Harness

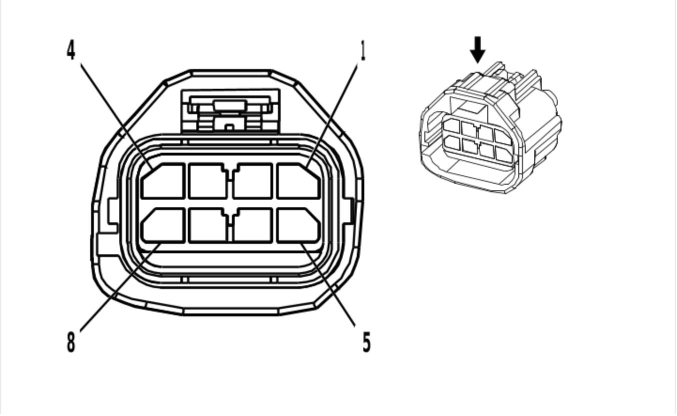
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY	(1) 4368	(1) III	(1) —	(1) Right Park Brake Motor Low Reference	(1) 1	(1) 4	(1) GY	(1) 4368	(1) IV	(1) —
(2) 2	(2) 0.75	(2) BU / VT	(2) 1335	(2) II	(2) —	(2) Right Rear Turn Signal Lamp Control 2	(2) 2	(2) 0.75	(2) BU / VT	(2) 1335	(2) V	(2) —
(3) 3	(3) 0.5	(3) BN / YE	(3) 820	(3) II	(3) —	(3) Center High Mounted Stop Lamp Supply Voltage	(3) 3	(3) 0.5	(3) BN / YE	(3) 820	(3) V	(3) —
(4) 4	(4) 0.5	(4) GN / BU	(4) 2733	(4) II	(4) —	(4) Brake System Control Module LIN Bus 2	(4) 4	(4) 0.5	(4) GN / BU	(4) 2733	(4) V	(4) —
(5) 5	(5) 0.35	(5) BN / GN	(5) 3568	(5) II	(5) —	(5) Rear Closure Passive Entry Antenna High Signal	(5) 5	(5) 0.5	(5) BN / GN	(5) 3568	(5) V	(5) —
(6) 6	(6) 0.35	(6) GN / GY	(6) 3569	(6) II	(6) —	(6) Rear Closure Passive Entry Antenna Low Signal	(6) 6	(6) 0.5	(6) GN / GY	(6) 3569	(6) V	(6) —
(7) 7	(7) 0.75	(7) BU / WH	(7) 1334	(7) II	(7) —	(7) Left Rear Turn Signal Lamp Control 2	(7) 7	(7) 0.75	(7) BU / WH	(7) 1334	(7) V	(7) —
(8) 8	(8) 0.5	(8) WH / VT	(8) 1430	(8) II	(8) —	(8) Exterior Courtesy Lamp Control	(8) 8	(8) 0.5	(8) WH / VT	(8) 1430	(8) V	(8) —
(9) 9	(9) 0.5	(9) GN / YE	(9) 1616	(9) II	(9) —	(9) Rear Brake Pad Wear Sensor Signal	(9) 9	(9) 0.5	(9) GN / YE	(9) 1616	(9) V	(9) —
(10) 10	(10) 0.5	(10) WH / BK	(10) 2223	(10) II	(10) —	(10) Trailer Brake Apply Signal	(10) 10	(10) 0.5	(10) WH / BK	(10) 2223	(10) V	(10) —
(11) 11	(11) 0.35	(11) GN / YE	(11) 2862	(11) II	(11) —	(11) Body Control Module LIN Bus 16	(11) 11	(11) 0.5	(11) GN / YE	(11) 2862	(11) V	(11) —
12	—	—	—	—	—	Not Occupied	12	—	—	—	—	—
(13) 13	(13) 2.5	(13) GN / VT	(13) 1988	(13) III	(13) —	(13) Right Park Brake Motor Apply Control	(13) 13	(13) 4	(13) GN / VT	(13) 1988	(13) IV	(13) —
(14) 14	(14) 2.5	(14) RD / VT	(14) 4442	(14) I	(14) —	(14) Primary Fused Battery Positive Voltage	(14) 14	(14) 2.5	(14) RD / VT	(14) 4442	(14) VI	(14) —
(15) 15	(15) 0.5	(15) BU / YE	(15) 4979	(15) II	(15) —	(15) AUTOSAR CAN Bus [+] 2 Serial Data	(15) 15	(15) 0.5	(15) BU / YE	(15) 4979	(15) V	(15) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(16) 16	(16) 0.5	(16) WH	(16) 4978	(16) II	(16) —	(16) AUTOSAR CAN Bus [-] 2 Serial Data	(16) 16	(16) 0.5	(16) WH	(16) 4978	(16) V	(16) —
(17) 17	(17) 0.5	(17) WH	(17) 4976	(17) II	(17) —	(17) AUTOSAR CAN Bus [-] 3 Serial Data	(17) 17	(17) 0.5	(17) WH	(17) 4976	(17) V	(17) —
(18) 18	(18) 0.5	(18) BU / BK	(18) 4977	(18) II	(18) —	(18) AUTOSAR CAN Bus [+] 3 Serial Data	(18) 18	(18) 0.5	(18) BU / BK	(18) 4977	(18) V	(18) —
(19) 19	(19) 0.35	(19) WH / BK	(19) 7544	(19) II	(19) —	(19) Right Rear Turn Signal Lamp Feedback Signal	(19) 19	(19) 0.75	(19) WH / BK	(19) 7544	(19) V	(19) —
(20) 20	(20) 0.5	(20) BN / BU	(20) 1602	(20) II	(20) —	(20) Front Brake Pad Wear Sensor Signal	(20) 20	(20) 0.5	(20) BN / BU	(20) 1602	(20) V	(20) —
(21) 21	(21) 0.5	(21) VT	(21) 882	(21) II	(21) —	(21) Right Rear Wheel Speed Sensor Signal	(21) 21	(21) 0.5	(21) VT	(21) 882	(21) V	(21) —
(22) 22	(22) 0.5	(22) GY / YE	(22) 7128	(22) II	(22) —	(22) Right Rear Wheel Speed Sensor Control	(22) 22	(22) 0.5	(22) GY / YE	(22) 7128	(22) V	(22) —
(23) 23	(23) 0.5	(23) BU	(23) 884	(23) II	(23) —	(23) Left Rear Wheel Speed Sensor Signal	(23) 23	(23) 0.5	(23) BU	(23) 884	(23) V	(23) —
(24) 24	(24) 0.5	(24) GY / BK	(24) 7127	(24) II	(24) —	(24) Left Rear Wheel Speed Sensor Control	(24) 24	(24) 0.5	(24) GY / BK	(24) 7127	(24) V	(24) —
(25) 25	(25) 0.5	(25) GY	(25) 830	(25) II	(25) —	(25) Left Front Wheel Speed Sensor Signal	(25) 25	(25) 0.5	(25) GY	(25) 830	(25) V	(25) —
(26) 26	(26) 0.5	(26) GY / WH	(26) 7064	(26) II	(26) —	(26) Left Front Wheel Speed Sensor Control	(26) 26	(26) 0.5	(26) GY / WH	(26) 7064	(26) V	(26) —
(27) 27	(27) 2	(27) BU	(27) 47	(27) I	(27) —	(27) Trailer Auxiliary Control	(27) 27	(27) 2	(27) BU	(27) 47	(27) VI	(27) - JL1
(28) 28	(28) 0.5	(28) BN / GN	(28) 4246	(28) I	(28) —	(28) Identification Lamp Control	(28) 28	(28) 0.5	(28) BN / GN	(28) 4246	(28) VI	(28) —
(29) 29	(29) 2.5	(29) WH	(29) 2001	(29) III	(29) —	(29) Left Park Brake Motor Apply Control	(29) 29	(29) 4	(29) WH	(29) 2001	(29) IV	(29) —
(30) 30	(30) 0.35	(30) GY	(30) 7292	(30) I	(30) —	(30) Major Endgate Release Switch Signal Exterior	(30) 30	(30) 0.5	(30) GY	(30) 7292	(30) VI	(30) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(31) 31	(31) 0.35	(31) BN	(31) 10119	(31) II	(31) —	(31) AC Outlet 2 Low Reference	(31) 31	(31) 0.5	(31) BN	(31) 10119	(31) V	(31) —
(32) 32	(32) 0.75	(32) RD / WH	(32) 10121	(32) II	(32) —	(32) AC Outlet 2 Phase B Control	(32) 32	(32) 0.75	(32) RD / WH	(32) 10121	(32) V	(32) —
(33) 33	(33) 0.5	(33) GY / BU	(33) 7762	(33) II	(33) —	(33) Cargo Lamp Control	(33) 33	(33) 0.5	(33) GY / BU	(33) 7762	(33) V	(33) —
(34) 34	(34) 0.5	(34) YE / BK	(34) 2224	(34) II	(34) —	(34) Trailer Brake Enable Signal	(34) 34	(34) 0.5	(34) YE / BK	(34) 2224	(34) V	(34) —
(35) 35	(35) 0.5	(35) GN / BN	(35) 2266	(35) II	(35) —	(35) DC/AC Inverter Control 2	(35) 35	(35) 0.5	(35) GN / BN	(35) 2266	(35) V	(35) —
(36) 36	(36) 0.5	(36) BN / WH	(36) 2374	(36) II	(36) —	(36) Object Sensor Voltage Reference	(36) 36	(36) 0.5	(36) BN / WH	(36) 2374	(36) V	(36) —
(37) 37	(37) 0.5	(37) YE	(37) 2375	(37) II	(37) —	(37) Left Rear Outer Parking Assist Sensor Signal	(37) 37	(37) 0.5	(37) YE	(37) 2375	(37) V	(37) —
(38) 38	(38) 0.5	(38) YE / BU	(38) 2376	(38) II	(38) —	(38) Left Rear Middle Parking Assist Sensor Signal	(38) 38	(38) 0.5	(38) YE / BU	(38) 2376	(38) V	(38) —
(39) 39	(39) 0.5	(39) YE / WH	(39) 2377	(39) II	(39) —	(39) Right Rear Middle Parking Assist Sensor Signal	(39) 39	(39) 0.5	(39) YE / WH	(39) 2377	(39) V	(39) —
(40) 40	(40) 0.5	(40) YE / VT	(40) 2378	(40) II	(40) —	(40) Right Rear Outer Parking Assist Sensor Signal	(40) 40	(40) 0.5	(40) YE / VT	(40) 2378	(40) V	(40) —
(41) 41	(41) 0.5	(41) BK / GY	(41) 2379	(41) II	(41) —	(41) Object Sensor Low Reference	(41) 41	(41) 0.5	(41) BK / GY	(41) 2379	(41) V	(41) —
(42) 42	(42) 0.5	(42) GN / WH	(42) 24	(42) II	(42) —	(42) Backup Lamp Control	(42) 42	(42) 0.5	(42) GN / WH	(42) 24	(42) V	(42) —
(43) 43	(43) 2.5	(43) GY / BK	(43) 4369	(43) III	(43) —	(43) Left Park Brake Motor Low Reference	(43) 43	(43) 4	(43) GY / BK	(43) 4369	(43) IV	(43) —
(44) 44	(44) 0.75	(44) BK / WH	(44) 10120	(44) II	(44) —	(44) AC Outlet 2 Phase A Control	(44) 44	(44) 0.75	(44) BK / WH	(44) 10120	(44) V	(44) —
(45) 45	(45) 0.35	(45) YE	(45) 7294	(45) II	(45) —	(45) Minor Endgate Release Switch Discrete Signal Exterior	(45) 45	(45) 0.5	(45) YE	(45) 7294	(45) V	(45) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(46) 46	(46) 0.5	(46) VT / RD	(46) 4049	(46) II	(46) —	(46) AC Power Outlet Sensor High Reference	(46) 46	(46) 0.5	(46) VT / RD	(46) 4049	(46) V	(46) —
(47) 47	(47) 0.5	(47) YE / GN	(47) 2024	(47) II	(47) —	(47) Animation Lighting Control	(47) 47	(47) 0.5	(47) YE / GN	(47) 2024	(47) V	(47) —
(48) 48	(48) 0.35	(48) WH / YE	(48) 7541	(48) II	(48) —	(48) Right Rear Stop Lamp Control	(48) 48	(48) 0.75	(48) WH / YE	(48) 7541	(48) V	(48) —
(49) 49	(49) 0.75	(49) GY / YE	(49) 7542	(49) II	(49) —	(49) Left Rear Stop Lamp Control	(49) 49	(49) 0.75	(49) GY / YE	(49) 7542	(49) V	(49) —
(50) 50	(50) 0.5	(50) VT / BK	(50) 739	(50) II	(50) —	(50) Run/ Crank Ignition 1 Voltage	(50) 50	(50) 0.5	(50) VT / BK	(50) 739	(50) V	(50) —
(51) 51	(51) 0.35	(51) WH / VT	(51) 6567	(51) II	(51) —	(51) Rear Turn Signal Lamp Feedback Signal	(51) 51	(51) 0.75	(51) WH / VT	(51) 6567	(51) V	(51) —
(52) 52	(52) 0.5	(52) GN / YE	(52) 6846	(52) II	(52) —	(52) Rear License Plate Lamp Control	(52) 52	(52) 0.5	(52) GN / YE	(52) 6846	(52) V	(52) —
(53) 53	(53) 0.75	(53) BN / BU	(53) 6993	(53) II	(53) —	(53) Left Rear Park Lamp Control	(53) 53	(53) 0.75	(53) BN / BU	(53) 6993	(53) V	(53) —
(54) 54	(54) 0.75	(54) BN / GY	(54) 6995	(54) II	(54) —	(54) Right Rear Park Lamp Control	(54) 54	(54) 0.75	(54) BN / GY	(54) 6995	(54) V	(54) —
(55) 55	(55) 2.5	(55) RD / BN	(55) 4142	(55) III	(55) —	(55) Primary Fused Battery Positive Voltage	(55) 55	(55) 2.5	(55) RD / BN	(55) 3640	(55) IV	(55) —

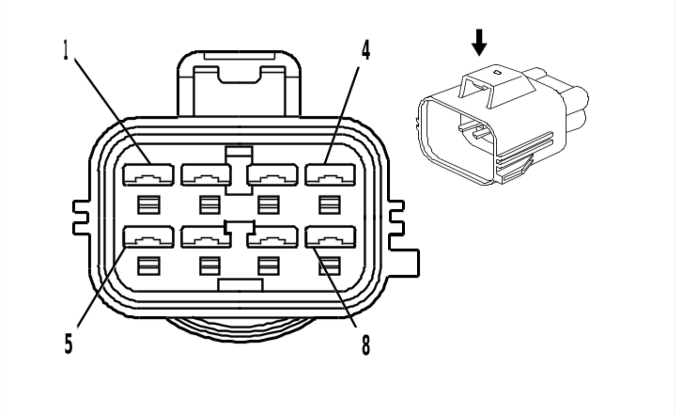
X412 Assist Step Motor jumper to Chassis Wiring Harness



1401778

Connector Part Information

- Harness Type: Assist Step M
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F



1856785

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 7282-5574-10
- Service Connector: 19367561
- Description: 8-Way M 2.8 YESC Series, Sealed(D-GY)

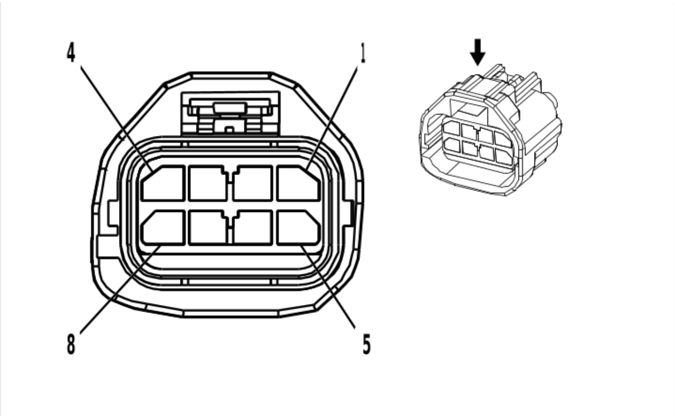
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required
II	Not required	J-35616-5 (PU)	No Tool Required

X412 Assist Step Motor jumper to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2	(1) WH / BN	(1) 7471	(1) I	(1) —	(1) Left Running Board Step Motor Control Extend	(1) 1	(1) 2	(1) WH / BN	(1) 7471	(1) II	(1) —
(2) 2	(2) 0.5	(2) VT / RD	(2) 7468	(2) I	(2) —	(2) Left Running Board Step Motor Hall Sensor 5V Reference	(2) 2	(2) 0.5	(2) VT / RD	(2) 7468	(2) II	(2) —
(3) 3	(3) 0.5	(3) YE	(3) 7467	(3) I	(3) —	(3) Left Running Board Step Motor Hall Sensor Signal	(3) 3	(3) 0.5	(3) YE	(3) 7467	(3) II	(3) —
(4) 4	(4) 0.5	(4) YE / BN	(4) 7466	(4) I	(4) —	(4) Left Running Board Step Motor Hall Sensor Low Reference	(4) 4	(4) 0.5	(4) YE / BN	(4) 7466	(4) II	(4) —
(5) 5	(5) 2	(5) GY	(5) 7472	(5) I	(5) —	(5) Left Running Board Step Motor Control Retract	(5) 5	(5) 2	(5) GY	(5) 7472	(5) II	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—
(7) 7	(7) 0.5	(7) BN	(7) 4748	(7) I	(7) —	(7) Left Running Board Step Courtesy Lamp Control	(7) 7	(7) 0.5	(7) BN	(7) 4748	(7) II	(7) —
(8) 8	(8) 0.5	(8) BK	(8) 1850	(8) I	(8) —	(8) Ground	(8) 8	(8) 0.5	(8) BK	(8) 1850	(8) II	(8) —

X413 Assist Step Motor jumper to Chassis Wiring Harness



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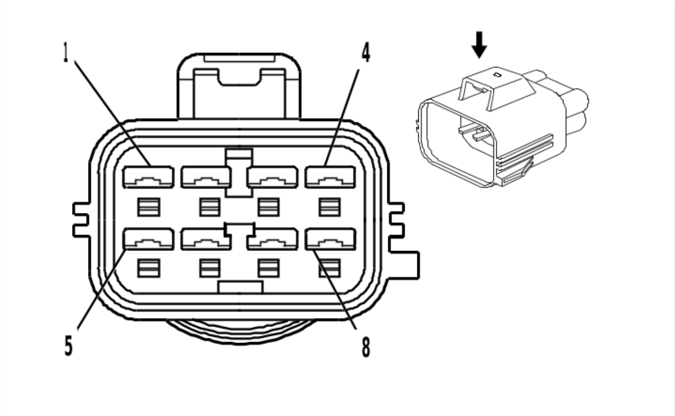


1856785

Connector Part Information
- Harness Type: Assist Step M
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way F

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 7282-5574-10
- Service Connector: 19367561
- Description: 8-Way M 2.8 YESC Series, Sealed(D-GY)

Terminal Part Information

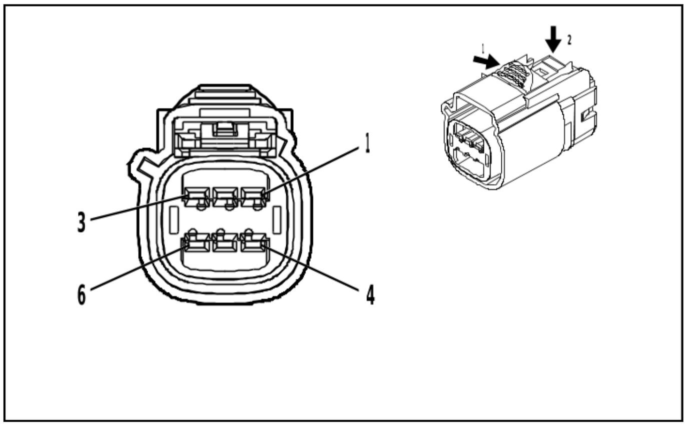
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required
II	Not required	J-35616-5 (PU)	No Tool Required

X413 Assist Step Motor jumper to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2	(1) BU	(1) 7470	(1) I	(1) —	(1) Right Running Board Step Motor Control Extend	(1) 1	(1) 2	(1) BU	(1) 7470	(1) II	(1) —
(2) 2	(2) 0.5	(2) GN / RD	(2) 7464	(2) I	(2) —	(2) Right Running Board Step Motor Hall Sensor 5V Reference	(2) 2	(2) 0.5	(2) GN / RD	(2) 7464	(2) II	(2) —
(3) 3	(3) 0.5	(3) VT	(3) 7465	(3) I	(3) —	(3) Right Running Board Step Motor Hall Sensor Signal	(3) 3	(3) 0.5	(3) VT	(3) 7465	(3) II	(3) —
(4) 4	(4) 0.5	(4) YE / BK	(4) 7463	(4) I	(4) —	(4) Right Running Board Step Motor Hall Sensor Low Reference	(4) 4	(4) 0.5	(4) YE / BK	(4) 7463	(4) II	(4) —
(5) 5	(5) 2	(5) GN	(5) 7469	(5) I	(5) —	(5) Right Left Running Board Step Motor Control Retract	(5) 5	(5) 2	(5) GN	(5) 7469	(5) II	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(7) 7	(7) 0.5	(7) GY / VT	(7) 4749	(7) I	(7) —	(7) Right Running Board Step Courtesy Lamp Control	(7) 7	(7) 0.5	(7) GY / VT	(7) 4749	(7) II	(7) —
(8) 8	(8) 0.5	(8) BK	(8) 1850	(8) I	(8) —	(8) Ground	(8) 8	(8) 0.5	(8) BK	(8) 1850	(8) II	(8) —

X414 Chassis Rear Wiring Harness to Chassis Wiring Harness



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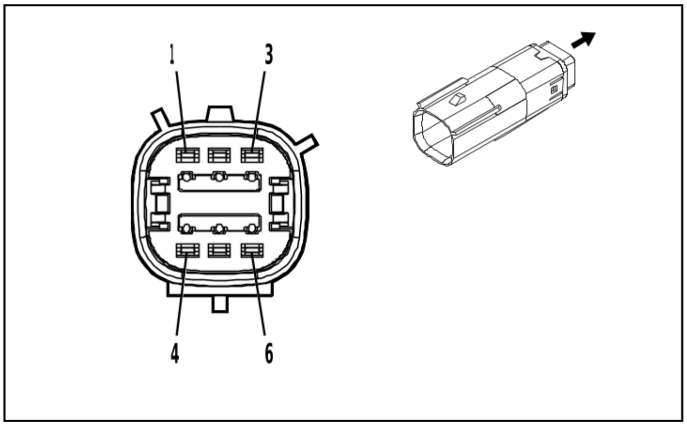


4992963

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness
- OEM Connector: 15513505
- Service Connector: 85669156
- Description: 6-Way F 1.5 OCS Series, Sealed(GY)

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 15513475
- Service Connector: 19371205
- Description: 6-Way M 1.5 OCS Series, Sealed(GY)

Terminal Part Information

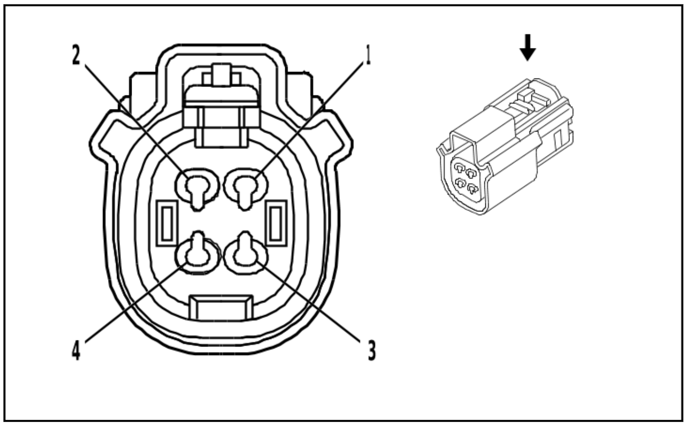
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	J-35616-3 (GY)	No Tool Required

X414 Chassis Rear Wiring Harness to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BK / WH	(1) 10120	(1) I	(1) —	(1) AC Outlet 2 Phase A Control	(1) 1	(1) 0.75	(1) BK / WH	(1) 10120	(1) II	(1) —
(2) 2	(2) 0.5	(2) BN	(2) 10119	(2) I	(2) —	(2) AC Outlet 2 Low Reference	(2) 2	(2) 0.5	(2) BN	(2) 10119	(2) II	(2) —
(3) 3	(3) 0.5	(3) VT / RD	(3) 4049	(3) I	(3) —	(3) AC Power Outlet Sensor High Reference	(3) 3	(3) 0.5	(3) VT / RD	(3) 4049	(3) II	(3) —
(4) 4	(4) 0.75	(4) RD / WH	(4) 10121	(4) I	(4) —	(4) AC Outlet 2 Phase B Control	(4) 4	(4) 0.75	(4) RD / WH	(4) 10121	(4) II	(4) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(5) 5	(5) 0.5	(5) GN / BN	(5) 2266	(5) I	(5) —	(5) DC/AC Inverter Control 2	(5) 5	(5) 0.5	(5) GN / BN	(5) 2266	(5) II	(5) —
(6) 6	(6) 0.5	(6) BK	(6) 1750	(6) I	(6) —	(6) Ground	(6) 6	(6) 1.5	(6) BK	(6) 1750	(6) II	(6) —

X415 Engine Wiring Harness to Transfer Case Selector Shift Control Switch Wiring Harness Extension Harness (NQF / NQH)



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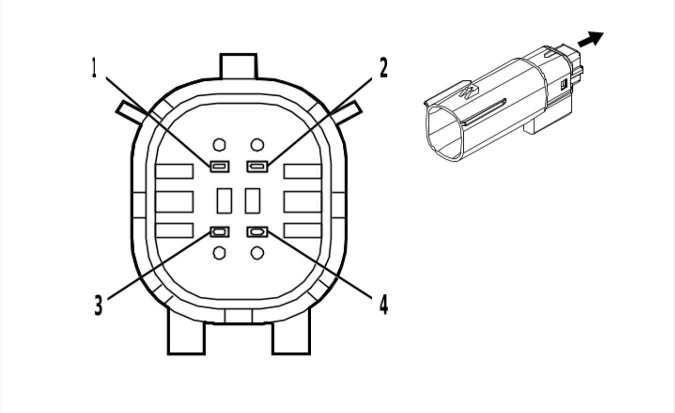


2368875

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 33472-4006
- Service Connector: 19368217
- Description: 4-Way F 1.5 MX Series, Sealed(BK)

Connector Part Information

- Harness Type: Transfer Case Selector Shift Control Switch Wiring Harness Extension Harness
- OEM Connector: 33482-4001
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.5 MX Series, Sealed(BK)

Terminal Part Information

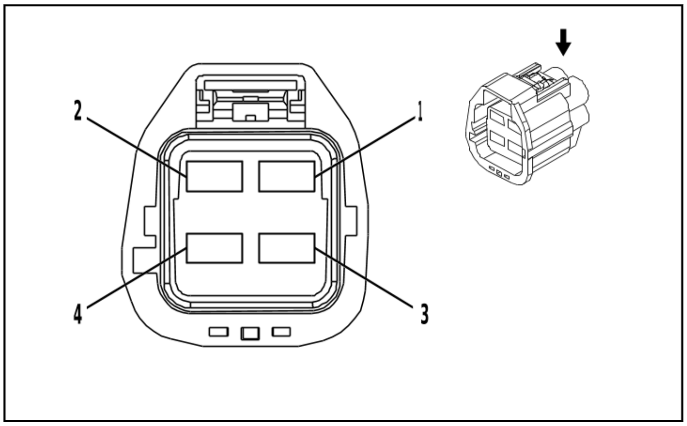
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-2A (GY)	No Tool Required
III	Not required	J-35616-3 (GY)	No Tool Required

X415 Engine Wiring Harness to Transfer Case Selector Shift Control Switch Wiring Harness Extension Harness (NQF / NQH)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / BK	(1) 1570	(1) II	(1) —	(1) Front Axle Actuator Control	(1) 1	(1) 0.5	(1) GY / BK	(1) 1570	(1) III	(1) —
(2) 2	(2) 0.5	(2) YE / WH	(2) 1695	(2) II	(2) —	(2) 4WD Locked Range Indicator Control	(2) 2	(2) 0.5	(2) YE / WH	(2) 1695	(2) III	(2) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(3) 3	(3) 0.5	(3) GN	(3) 8016	(3) II	(3) —	(3) Secondary Axle Motor Control	(3) 3	(3) 0.5	(3) GN	(3) 8016	(3) III	(3) —
(4) 4	(4) 1.5	(4) BK	(4) 450	(4) I	(4) —	(4) Ground	(4) 4	(4) 0.5	(4) BK	(4) 450	(4) III	(4) —

X420A Chassis Rear Wiring Harness Extension Harness to Chassis Wiring Harness



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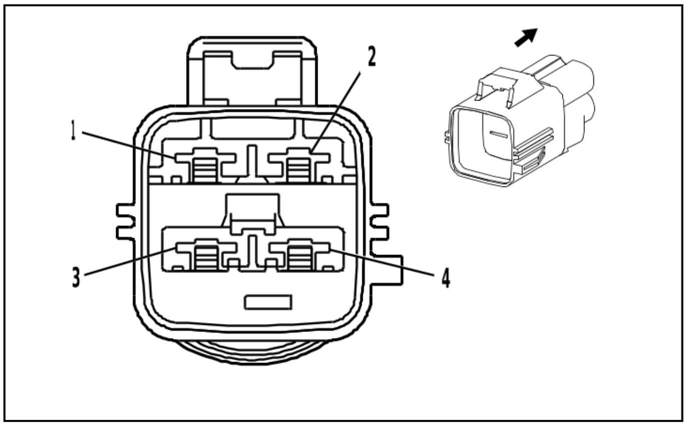


1853524

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: 13594129
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way F 6.3 Series, Sealed(GY)

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 7288-3029-10
- Service Connector: 19371198
- Description: 4-Way M 6.3 Series, Sealed(GY)

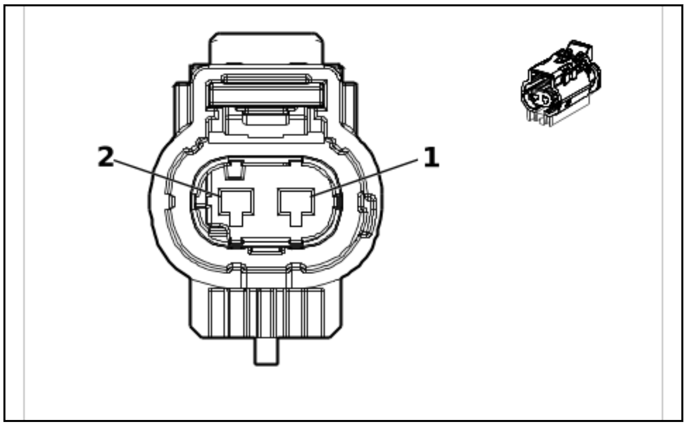
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-43 (RD)	No Tool Required

X420A Chassis Rear Wiring Harness Extension Harness to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) WH	(1) 2001	(1) I	(1) —	(1) Left Park Brake Motor Apply Control	(1) 1	(1) 4	(1) WH	(1) 2001	(1) II	(1) —
(2) 2	(2) 2.5	(2) GN / BK	(2) 4369	(2) I	(2) —	(2) Left Park Brake Motor Low Reference	(2) 2	(2) 4	(2) GY / BK	(2) 4369	(2) II	(2) —
(3) 3	(3) 2.5	(3) GN / VT	(3) 1988	(3) I	(3) —	(3) Right Park Brake Motor Apply Control	(3) 3	(3) 4	(3) GN / VT	(3) 1988	(3) II	(3) —
(4) 4	(4) 2.5	(4) GY	(4) 4368	(4) I	(4) —	(4) Right Park Brake Motor Low Reference	(4) 4	(4) 4	(4) GY	(4) 4368	(4) II	(4) —

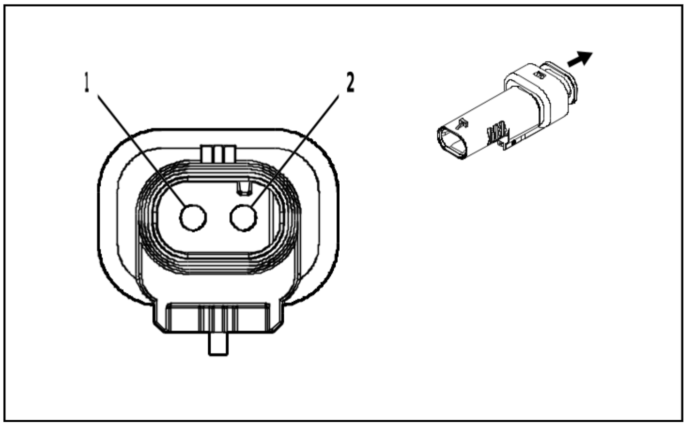
X420B Chassis Rear Wiring Harness Extension Harness to Chassis Wiring Harness (JBP - G94)



6819416

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: 13551879
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MLK Series, Sealed(GY)



4992757

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 10094251
- Service Connector: 19371200
- Description: 2-Way M 1.2 MLK Series, Sealed(GY)

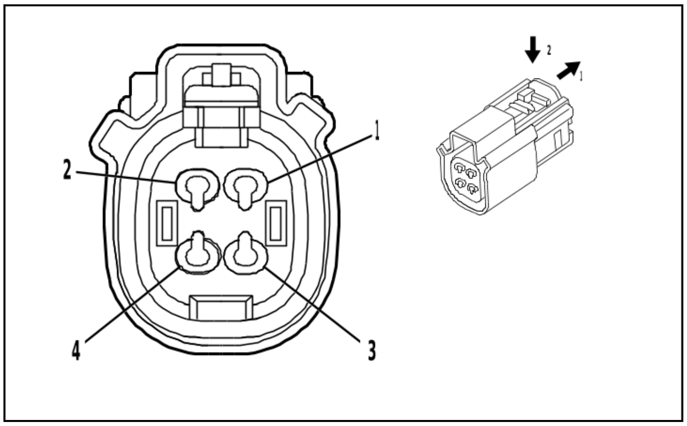
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-13 (BU)	No Tool Required
III	Not required	J-35616-17 (L-GN)	No Tool Required

X420B Chassis Rear Wiring Harness Extension Harness to Chassis Wiring Harness (JBP - G94)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) GN / YE	(1) 1616	(1) I	(1) —	(1) Rear Brake Pad Wear Sensor Signal	(1) 1	(1) 0.5	(1) GN / YE	(1) 1616	(1) III	(1) —
(2) 2	(2) 0.75	(2) BK / WH	(2) 1751	(2) I	(2) —	(2) Signal Ground (2) Signal Ground	(2) 2	(2) 1 (2) 1	(2) BK / WH (2) BK / WH	(2) 1151 (2) 1951	(2) II (2) II	(2) - (NV8/ BRS/ L5P) (2) (NV8/ BRS/ L5P)

X420B Chassis Wiring Harness to Chassis Rear Wiring Harness Extension Harness (JBP & G94)



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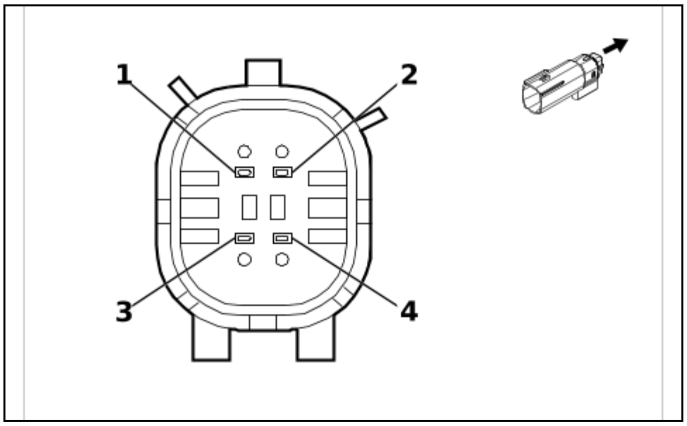


5604894

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 33472-4007
- Service Connector: 19368970
- Description: 4-Way F 1.5 MX Series, Sealed(GY)

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: 13510902
- Service Connector: Service by Harness - See Part Catalog
- Description: 4-Way M 1.5 MX Series, Sealed(GY)

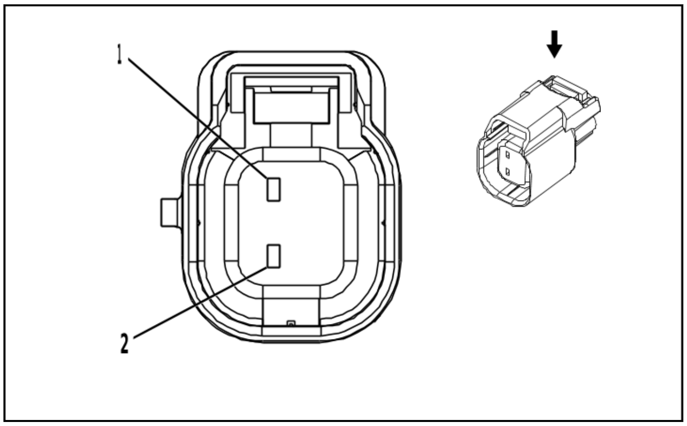
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-3 (GY)	No Tool Required

X420B Chassis Wiring Harness to Chassis Rear Wiring Harness Extension Harness (JBP & G94)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GN / YE	(1) 1616	(1) I	(1) —	(1) Rear Brake Pad Wear Sensor Signal	(1) 1	(1) 0.75	(1) GN / YE	(1) 1616	(1) II	(1) —
(2) 2	(2) 1	(2) BK / WH	(2) 1951	(2) I	(2) —	(2) Signal Ground	(2) 2	(2) 0.75	(2) BK / WH	(2) 1751	(2) II	(2) —
(3) 3	(3) 0.75	(3) GY / BK	(3) 7253	(3) I	(3) —	(3) Rear Differential Lock Actuator Low Control	(3) 3	(3) 0.75	(3) GY / BK	(3) 7253	(3) II	(3) —
(4) 4	(4) 0.75	(4) VT / BN	(4) 7258	(4) I	(4) —	(4) Rear Differential Lock Actuator Control	(4) 4	(4) 0.75	(4) VT / BN	(4) 7258	(4) II	(4) —

X421A Chassis Wiring Harness to Chassis Rear Wiring Harness Extension Harness



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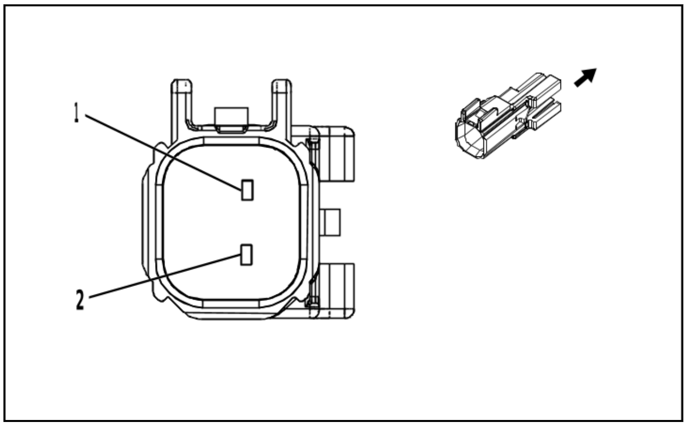


3271068

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 34062-0046
- Service Connector: 19366860
- Description: 2-Way F 1.5 Series, Sealed(BK)

Connector Part Information

- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M (BK)

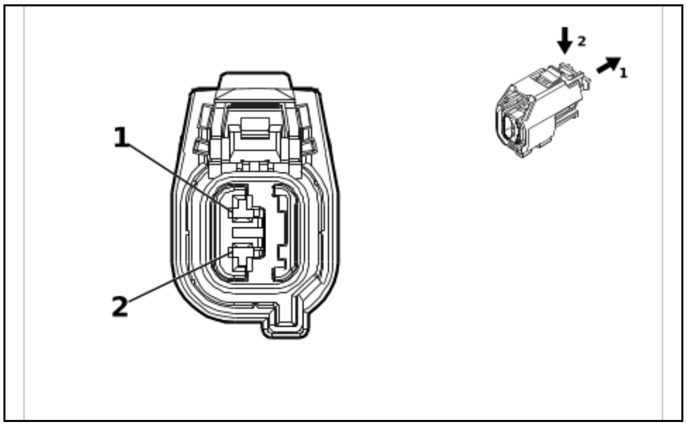
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	No Tool Required	No Tool Required

X421A Chassis Wiring Harness to Chassis Rear Wiring Harness Extension Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / YE	(1) 7128	(1) I	(1) —	(1) Right Rear Wheel Speed Sensor Control	(1) 1	(1) 0.5	(1) GY / YE	(1) 7128	(1) II	(1) —
(2) 2	(2) 0.5	(2) VT	(2) 882	(2) I	(2) —	(2) Right Rear Wheel Speed Sensor Signal	(2) 2	(2) 0.5	(2) VT	(2) 882	(2) II	(2) —

X421B Chassis Wiring Harness to Chassis Rear Wiring Harness Extension Harness



5666214

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Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 33189092
- Service Connector: 85526683
- Description: 2-Way F 1.5 OCS Series, Sealed(GY)

Connector Part Information
- Harness Type: Chassis Rear Wiring Harness Extension Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M (GY)

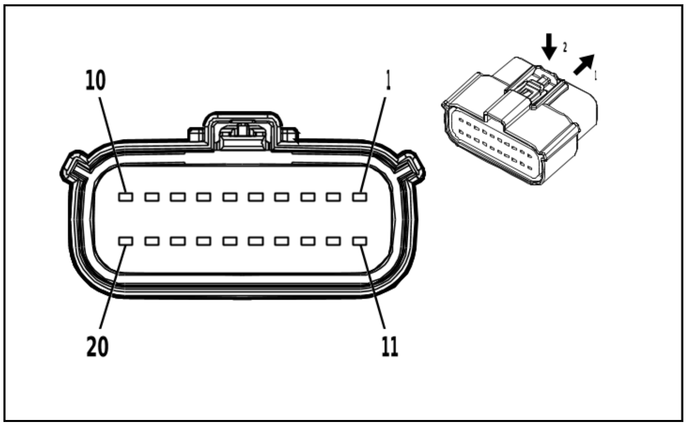
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	Not required	No Tool Required	No Tool Required

X421B Chassis Wiring Harness to Chassis Rear Wiring Harness Extension Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) GY / BK	(1) 7127	(1) I	(1) —	(1) Left Rear Wheel Speed Sensor Control	(1) 1	(1) 0.5	(1) GY / BK	(1) 7127	(1) II	(1) —
(2) 2	(2) 0.5	(2) BU	(2) 884	(2) I	(2) —	(2) Left Rear Wheel Speed Sensor Signal	(2) 2	(2) 0.5	(2) BU	(2) 884	(2) II	(2) —

X424 Body Wiring Harness to Chassis Wiring Harness



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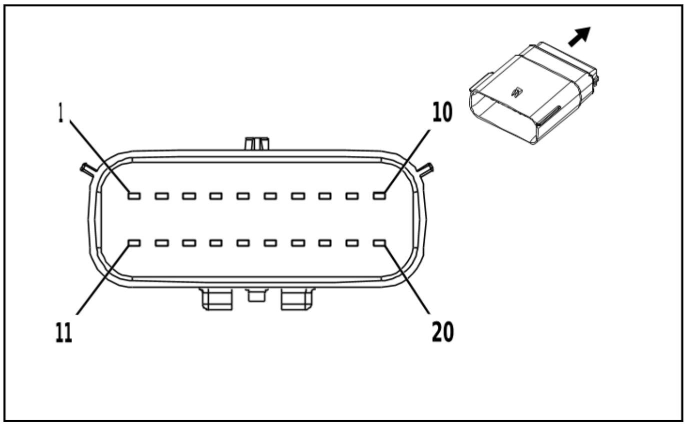


2871861

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 35600460
- Service Connector: 19300557
- Description: 20-Way F 1.5 MX Series, Sealed(BK)

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13598210
- Service Connector: 19351705
- Description: 20-Way M 1.5 MX Series, Sealed(BK)

Terminal Part Information

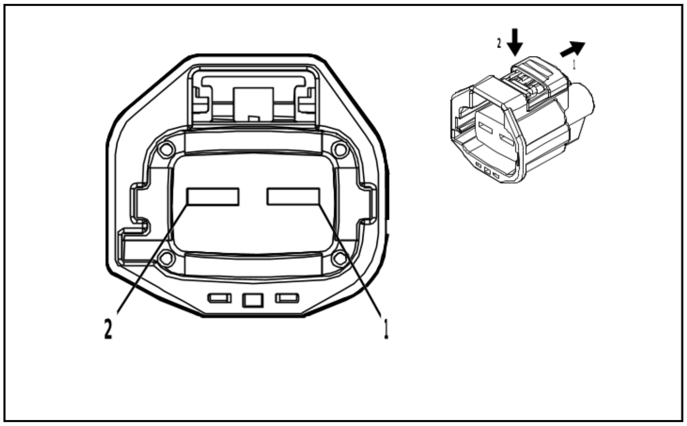
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85528055	J-35616-2A (GY)	J-38125-217
II	86800300	J-35616-3 (GY)	J-38125-217

X424 Body Wiring Harness to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) YE	(1) 7115	(1) I	(1) —	(1) Rear Axle Differential Lock Indicator Control	(1) 1	(1) 0.5	(1) YE	(1) 7115	(1) II	(1) —
(2) 2	(2) 0.35	(2) YE / GN	(2) 7122	(2) I	(2) —	(2) Axle Differential Lock Switch Signal	(2) 2	(2) 0.5	(2) YE / GN	(2) 7122	(2) II	(2) —
(3) 3	(3) 0.5	(3) WH	(3) 4100	(3) I	(3) —	(3) AUTOSAR CAN Bus [-] 4 Serial Data	(3) 3	(3) 0.5	(3) WH	(3) 4100	(3) II	(3) —
(4) 4	(4) 0.5	(4) BU / VT	(4) 4101	(4) I	(4) —	(4) AUTOSAR CAN Bus [+] 4 Serial Data	(4) 4	(4) 0.5	(4) BU / VT	(4) 4101	(4) II	(4) —
5 - 8	—	—	—	—	—	Not Occupied	5 - 8	—	—	—	—	—
(9) 9	(9) 0.35	(9) YE	(9) 1144	(9) I	(9) —	(9) Endgate Release Switch Discrete Signal Exterior	(9) 9	(9) 0.5	(9) YE	(9) 1144	(9) II	(9) —
(10) 10	(10) 1	(10) GN	(10) 1299	(10) I	(10) —	(10) Major Endgate Motor Control	(10) 10	(10) 1	(10) GN	(10) 1299	(10) II	(10) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(11) 11	(11) 0.5	(11) WH	(11) 4986	(11) I	(11) —	(11) AUTOSAR CAN Bus [-] 1 Serial Data	(11) 11	(11) 0.5	(11) WH	(11) 4986	(11) II	(11) —
(12) 12	(12) 0.5	(12) BU	(12) 4987	(12) I	(12) —	(12) AUTOSAR CAN Bus [+] 1 Serial Data	(12) 12	(12) 0.5	(12) BU	(12) 4987	(12) II	(12) —
(13) 13	(13) 0.35	(13) YE / BU	(13) 7295	(13) I	(13) —	(13) Left Minor Endgate Ajar Signal	(13) 13	(13) 0.75	(13) YE / BU	(13) 7295	(13) II	(13) —
14	—	—	—	—	—	Not Occupied	14	—	—	—	—	—
(15) 15	(15) 1	(15) VT	(15) 7725	(15) I	(15) —	(15) Minor Endgate Motor Control	(15) 15	(15) 1	(15) VT	(15) 7725	(15) II	(15) —
(16) 16	(16) 1	(16) YE / BK	(16) 7730	(16) I	(16) —	(16) Major Endgate Motor Low Reference	(16) 16	(16) 1	(16) YE / BK	(16) 7730	(16) II	(16) —
(17) 17	(17) 0.5	(17) WH	(17) 4986	(17) I	(17) —	(17) AUTOSAR CAN Bus [-] 1 Serial Data	(17) 17	(17) 0.5	(17) WH	(17) 4986	(17) II	(17) —
(18) 18	(18) 0.5	(18) BU	(18) 4987	(18) I	(18) —	(18) AUTOSAR CAN Bus [+] 1 Serial Data	(18) 18	(18) 0.5	(18) BU	(18) 4987	(18) II	(18) —
19 - 20	—	—	—	—	—	Not Occupied	19 - 20	—	—	—	—	—

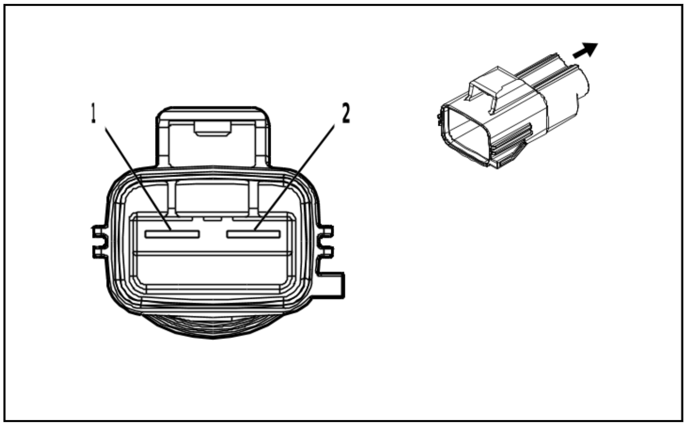
X426 Battery Positive Cable Extension Cable to Auxiliary Fuse Block Wiring Harness (K4Z)



4584202

Connector Part Information

- Harness Type: Battery Positive Cable
- OEM Connector: 13596768
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 6.3 Series, Sealed(D-GY)



4789729

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 7286-9860-10
- Service Connector: 19368221
- Description: 2-Way M 6.3 YESC Series, Sealed(GY)

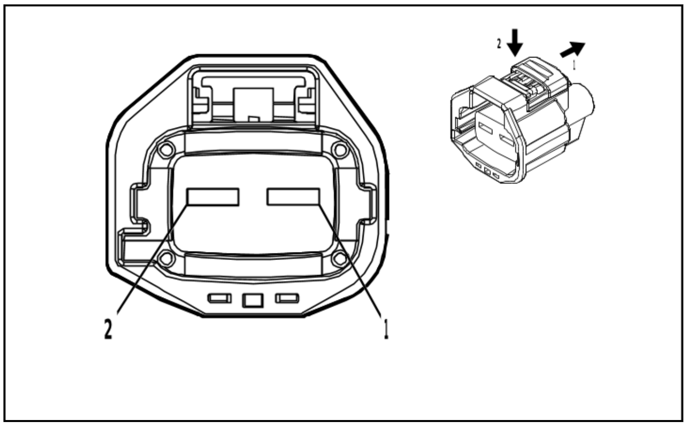
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-43 (RD)	No Tool Required

X426 Battery Positive Cable Extension Cable to Auxiliary Fuse Block Wiring Harness (K4Z)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 4	(1) RD / GN	(1) 842	(1) I	(1) K4Z	(1) Battery Positive Voltage	(1) 1	(1) 4	(1) OG	(1) 3640	(1) II	(1) —
2	—	—	—	—	—	Not Occupied	2	—	—	—	—	—

X426 Chassis Wiring Harness to Chassis Wiring Harness (- K4Z)



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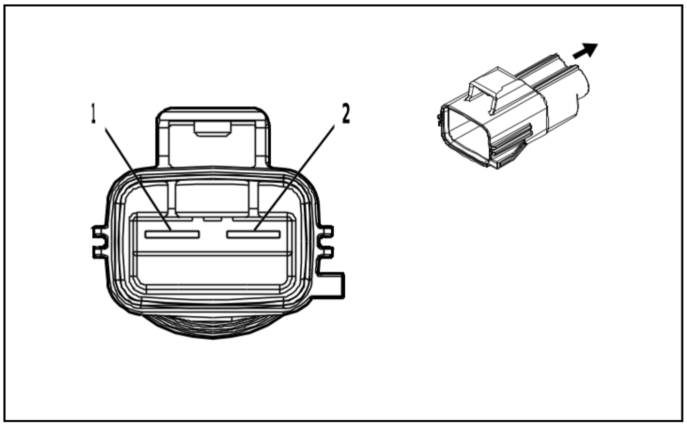


4789729

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13596768
- Service Connector: 19368222
- Description: 2-Way F 6.3 Series, Sealed(D-GY)

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 7286-9860-10
- Service Connector: 19368221
- Description: 2-Way M 6.3 YESC Series, Sealed(GY)

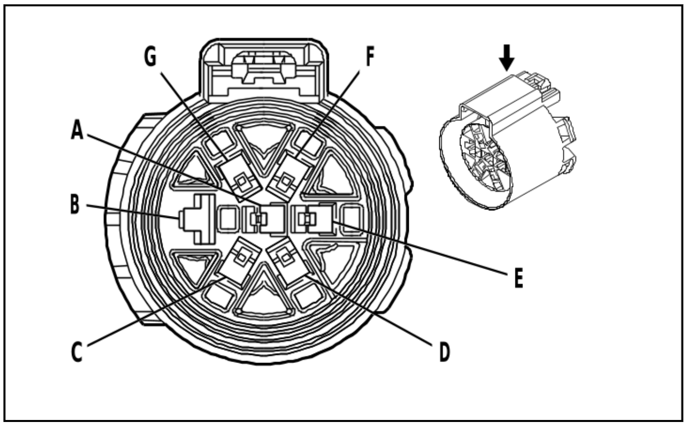
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-43 (RD)	No Tool Required

X426 Chassis Wiring Harness to Chassis Wiring Harness (- K4Z)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 4	(1) OG	(1) 3940	(1) I	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 4	(1) OG	(1) 3640	(1) II	(1) —
2	—	—	—	—	—	Not Occupied	2	—	—	—	—	—

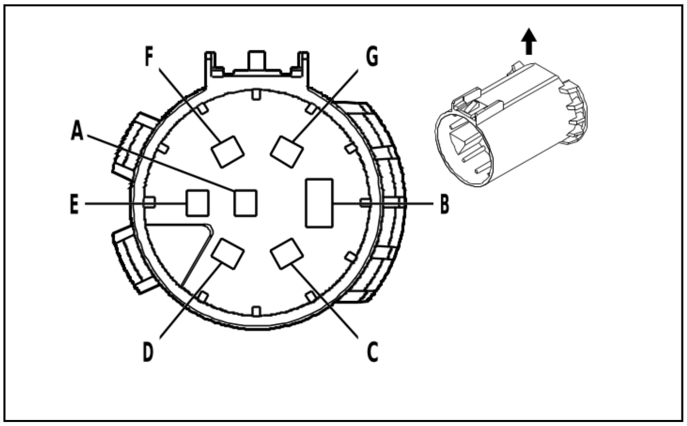
X480 Chassis Wiring Harness to Trailer Rear Wiring Harness



2056936

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13857223
- Service Connector: 86816072
- Description: 7-Way F 280, 630 Metri-Pack Series, Sealed(BK)



366087

Connector Part Information

- Harness Type: Trailer Rear Wiring Harness
- OEM Connector: 15317327
- Service Connector: Service by Harness - See Part Catalog
- Description: 7-Way M 280 Metri-Pack Series, Sealed(BK)

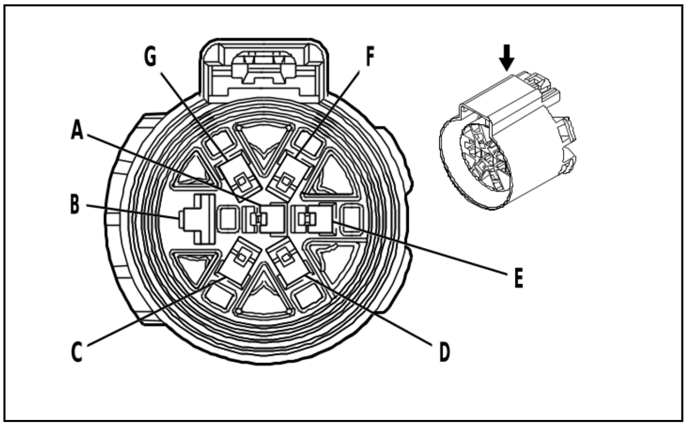
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required
III	Not required	J-35616-43 (RD)	No Tool Required
IV	Not required	J-35616-5 (PU)	No Tool Required

X480 Chassis Wiring Harness to Trailer Rear Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
A	1	GY	1624	II	—	Trailer Backup Lamp Control	A	1	GY	1624	IV	—
B	5	WH	22	I	—	Trailer Ground	B	5	WH	22	III	—
C	4	BU	47	II	—	Trailer Auxiliary Control	C	4	BU	47	IV	—
D	1	GN	1619	II	—	Right Rear Trailer Stop/ Turn Lamp Control	D	1	GN	1619	IV	—
E	4 4	OG OG	3940 3640	II II	− (UET / UY2) 8S3	Battery Positive Voltage Battery Positive Voltage	E	4	OG	3640	IV	—
F	1.5	BN	2109	II	—	Trailer Park Lamp Control	F	2	BN	2109	IV	—
G	1	YE	1618	II	—	Left Rear Trailer Stop/ Turn Lamp Control	G	1	YE	1618	IV	—

X481 Trailer Rear Wiring Harness to Trailer Rear Wiring Harness



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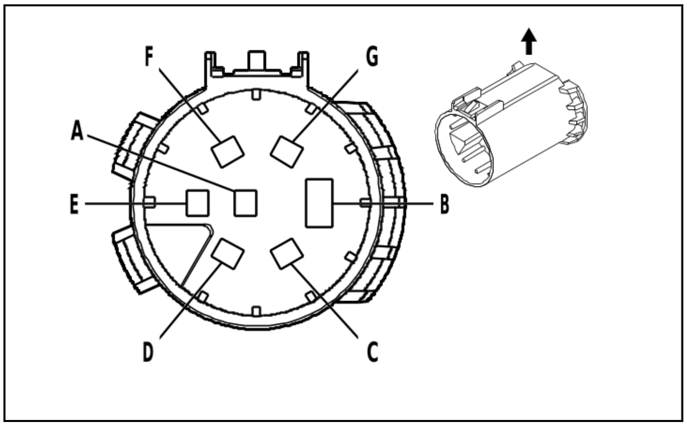


366087

Connector Part Information
- Harness Type: Trailer Rear Wiring Harness
- OEM Connector: 13857223
- Service Connector: Service by Harness - See Part Catalog
- Description: 7-Way F 280, 630 Metri-Pack Series, Sealed(BK)

Connector Part Information
- Harness Type: Trailer Rear Wiring Harness
- OEM Connector: 15317327
- Service Connector: Service by Harness - See Part Catalog
- Description: 7-Way M 280 Metri-Pack Series, Sealed(BK)

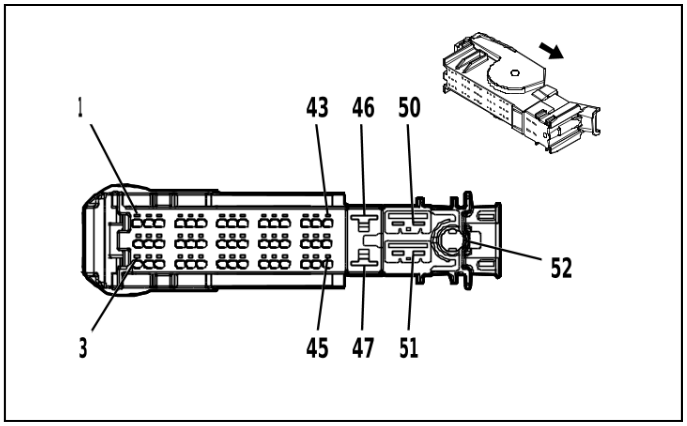
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-42 (RD)	No Tool Required
II	Not required	J-35616-4A (PU)	No Tool Required
III	Not required	J-35616-43 (RD)	No Tool Required
IV	Not required	J-35616-5 (PU)	No Tool Required

X481 Trailer Rear Wiring Harness to Trailer Rear Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
A	1	GY	1624	II	—	Trailer Backup Lamp Control	A	1	GY	1624	IV	—
B	5	WH	22	I	—	Trailer Ground	B	5	WH	22	III	—
C	4	BU	47	II	—	Trailer Auxiliary Control	C	4	BU	47	IV	—
D	1	GN	1619	II	—	Right Rear Trailer Stop/ Turn Lamp Control	D	1	GN	1619	IV	—
E	4	OG	3640	II	—	Battery Positive Voltage	E	4	OG	3640	IV	—
F	1.5	BN	2109	II	—	Trailer Park Lamp Control	F	2	BN	2109	IV	—
G	1	YE	1618	II	—	Left Rear Trailer Stop/ Turn Lamp Control	G	1	YE	1618	IV	—

X500 Front Side Door Door Wiring Harness - Left to Body Wiring Harness



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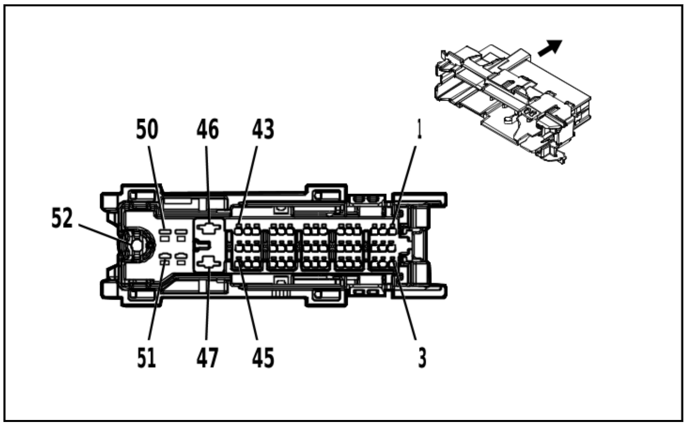


4993484

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: 6098-8365
- Service Connector: Service by Harness - See Part Catalog
- Description: 52-Way F 1.2, 2.8, 6.3, Coaxial Series(BK)

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 13527236
- Service Connector: 13527236
- Description: 52-Way M 1.2, 2.8, 6.3, Coaxial Series(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required
III	Not required	J-35616-42 (RD)	No Tool Required
IV	Service by Cable	No Tool Required	No Tool Required
V	19301536	J-35616-43 (RD)	J-38125-11A
VI	84616651	J-35616-13 (BU)	J-38125-215A
VII	Service by Cable	No Tool Required	No Tool Required

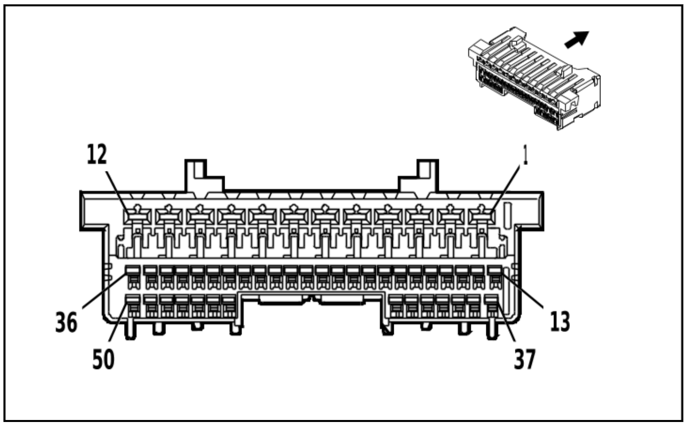
X500 Front Side Door Door Wiring Harness - Left to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1	—	—	—	—	—	Not Occupied	1	—	—	—	—	—
(2) 2	(2) 0.5	(2) RD / BU	(2) 1240	(2) II	(2) —	(2) Battery Positive Voltage	(2) 2	(2) 0.5	(2) RD / BU	(2) 1240	(2) VI	(2) —
3 - 6	—	—	—	—	—	Not Occupied	3 - 6	—	—	—	—	—
(7) 7	(7) 0.75	(7) BN / BU	(7) 118	(7) II	(7) —	(7) Left Front Speaker [-] Control 1	(7) 7	(7) 0.75	(7) BN / BU	(7) 118	(7) VI	(7) —
(8) 8	(8) 0.75	(8) BU	(8) 201	(8) II	(8) —	(8) Left Front Speaker 1 [+] Control	(8) 8	(8) 0.75	(8) BU	(8) 201	(8) VI	(8) —
(9) 9	(9) 0.5	(9) OG / GN	(9) 2132	(9) II	(9) —	(9) Left Front Side Impact Sensor Signal	(9) 9	(9) 0.5	(9) OG / GN	(9) 2132	(9) VI	(9) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(10) 10	(10) 0.5	(10) BK / OG	(10) 6628	(10) II	(10) —	(10) Left Front Side Impact Sensor Low Reference	(10) 10	(10) 0.5	(10) BK / OG	(10) 6628	(10) VI	(10) —
(11) 11	(11) 0.5	(11) VT	(11) 4301	(11) II	(11) —	(11) Passive Entry Left Antenna Signal High	(11) 11	(11) 0.35	(11) VT	(11) 4301	(11) VI	(11) —
(12) 12	(12) 0.5	(12) VT / GY	(12) 4302	(12) II	(12) —	(12) Passive Entry Left Antenna Signal Low	(12) 12	(12) 0.35	(12) VT / GY	(12) 4302	(12) VI	(12) —
(13) 13	(13) 0.5	(13) VT / GY	(13) 126	(13) II	(13) —	(13) Left Front Door Open Switch Signal	(13) 13	(13) 0.35	(13) VT / GY	(13) 126	(13) VI	(13) —
(14) 14	(14) 0.5	(14) YE / WH	(14) 1690	(14) II	(14) —	(14) Mirror Dimming Signal	(14) 14	(14) 0.35	(14) YE / WH	(14) 1690	(14) VI	(14) —
(15) 15	(15) 0.5	(15) BK / YE	(15) 1691	(15) II	(15) —	(15) Automatic Day/Night Mirror Low Reference	(15) 15	(15) 0.35	(15) BK / YE	(15) 1691	(15) VI	(15) —
(16) 16	(16) 0.5	(16) WH / GY	(16) 2114	(16) II	(16) —	(16) Left Turn Signal Lamp Control 2	(16) 16	(16) 0.35	(16) WH / GY	(16) 2114	(16) VI	(16) —
(17) 17	(17) 0.5	(17) BU	(17) 2675	(17) II	(17) —	(17) Left Front Exterior Door Handle Switch Unlock Signal	(17) 17	(17) 0.35	(17) BU	(17) 2675	(17) VI	(17) —
(18) 18	(18) 0.75	(18) WH	(18) 2679	(18) II	(18) —	(18) Lock Actuators Unlock Control 1	(18) 18	(18) 0.75	(18) WH	(18) 2679	(18) VI	(18) —
(19) 19	(19) 0.75	(19) GY	(19) 2681	(19) II	(19) —	(19) Left Front Door Lock Actuator Lock Control	(19) 19	(19) 0.75	(19) GY	(19) 2681	(19) VI	(19) —
20 - 22	—	—	—	—	—	Not Occupied	20 - 22	—	—	—	—	—
(23) 23	(23) 0.5	(23) WH / GN	(23) 5966	(23) II	(23) —	(23) Approach Lamp Control	(23) 23	(23) 0.5	(23) WH / GN	(23) 5966	(23) VI	(23) —
24	—	—	—	—	—	Not Occupied	24	—	—	—	—	—
(25) 25	(25) 0.5	(25) BU / GN	(25) 614	(25) II	(25) —	(25) Seat Memory Switch Set Signal	(25) 25	(25) 0.35	(25) BU / GN	(25) 614	(25) VI	(25) —
(26) 26	(26) 0.5	(26) BU / YE	(26) 7761	(26) II	(26) —	(26) Backup Illumination Lamp Control	(26) 26	(26) 0.35	(26) BU / YE	(26) 7761	(26) VI	(26) —
(27) 27	(27) 0.35	(27) YE	(27) 6817	(27) I	(27) —	(27) LED Backlight Dimming Control 1	(27) 27	(27) 0.5	(27) YE	(27) 6817	(27) VI	(27) —
28	—	—	—	—	—	Not Occupied	28	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(29) 29	(29) 0.5	(29) GN / YE	(29) 6134	(29) II	(29) —	(29) Body Control Module LIN Bus 3	(29) 29	(29) 0.35	(29) GN / YE	(29) 6134	(29) VI	(29) —
(30) 30	(30) 0.5	(30) BN / GN	(30) 4246	(30) II	(30) —	(30) Identification Lamp Control	(30) 30	(30) 0.5	(30) BN / GN	(30) 4246	(30) VI	(30) —
(31) 31	(31) 0.5	(31) BK / WH	(31) 1551	(31) II	(31) —	(31) Signal Ground	(31) 31	(31) 0.5	(31) BK / WH	(31) 1551	(31) VI	(31) —
(32) 32	(32) 0.35	(32) YE / GY	(32) 2933	(32) I	(32) —	(32) Task Lamp Control Left	(32) 32	(32) 0.35	(32) YE / GY	(32) 2933	(32) VI	(32) —
(33) 33	(33) 0.5	(33) WH	(33) 615	(33) II	(33) —	(33) Seat Memory Switch Signal 1	(33) 33	(33) 0.35	(33) WH	(33) 615	(33) VI	(33) —
34 - 45	—	—	—	—	—	Not Occupied	34 - 45	—	—	—	—	—
(46) 46	(46) 2.5	(46) RD / GY	(46) 3540	(46) III	(46) —	(46) Battery Positive Voltage	(46) 46	(46) 2.5	(46) RD / GY	(46) 3540	(46) V	(46) —
(47) 47	(47) 2.5	(47) BK	(47) 1550	(47) III	(47) —	(47) Ground	(47) 47	(47) 2.5	(47) BK	(47) 1550	(47) V	(47) —
48 - 51	—	—	—	—	—	Not Occupied	48 - 51	—	—	—	—	—
(52) 52	(52) —	(52) Coax Cable	(52) 4725	(52) IV	(52) —	(52) Left Sideview Camera LVDS (Low Voltage Differential Signaling) Coaxial Signal	(52) 52	(52) —	(52) Coax Cable	(52) 4725	(52) VII	(52) —

X505 Front Side Door Door Wiring Harness - Left to Front Side Door Door Lock Door Wiring Harness - Left



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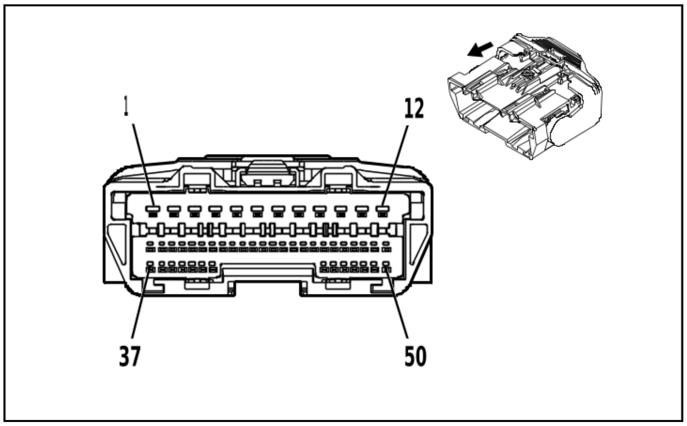


5022037

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Left
- OEM Connector: 35283943
- Service Connector: Service by Harness - See Part Catalog
- Description: 50-Way F 1.2, 2.8 OCS Series(BK)

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Left
- OEM Connector: 33390111
- Service Connector: Service by Harness - See Part Catalog
- Description: 50-Way M 1.2, 2.8 OCS Series(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required
III	Not required	J-35616-4A (PU)	No Tool Required
IV	Not required	J-35616-17 (L-GN)	No Tool Required
V	Not required	J-35616-5 (PU)	No Tool Required

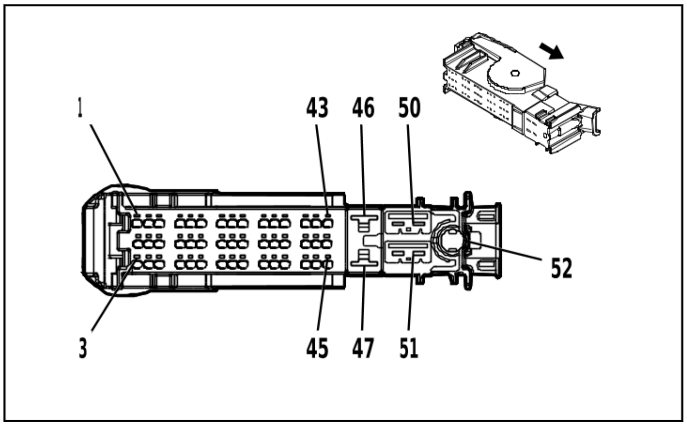
X505 Front Side Door Door Wiring Harness - Left to Front Side Door Door Lock Door Wiring Harness - Left

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / BU	(1) 1240	(1) III	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 0.5	(1) RD / BU	(1) 1240	(1) V	(1) —
(2) 2	(2) 0.5	(2) GY / YE	(2) 1760	(2) III	(2) —	(2) Left Side Object Detection LED Control	(2) 2	(2) 0.35	(2) GY / YE	(2) 1760	(2) V	(2) —
3	—	—	—	—	—	Not Occupied	3	—	—	—	—	—
(4) 4	(4) 0.5	(4) GY / GN	(4) 2763	(4) III	(4) —	(4) Window Switch Left Front Up Signal	(4) 4	(4) 0.5	(4) GY / GN	(4) 2763	(4) V	(4) —
(5) 5	(5) 0.5	(5) BN	(5) 10201	(5) III	(5) —	(5) Left Front Mirror Motor Extend Control	(5) 5	(5) 0.5	(5) BN	(5) 10201	(5) V	(5) —
(6) 6	(6) 0.5	(6) WH / BN	(6) 2764	(6) III	(6) —	(6) Window Switch Left Front Down Signal	(6) 6	(6) 0.5	(6) WH / BN	(6) 2764	(6) V	(6) —
7	—	—	—	—	—	Not Occupied	7	—	—	—	—	—
(8) 8	(8) 0.5	(8) GN	(8) 2766	(8) III	(8) —	(8) Power Window Switch Left Front Express Signal	(8) 8	(8) 0.5	(8) GN	(8) 2766	(8) V	(8) —
(9) 9	(9) 0.5	(9) WH / BK	(9) 10202	(9) III	(9) —	(9) Left Front Mirror Motor Retract Control	(9) 9	(9) 0.5	(9) WH / BK	(9) 10202	(9) V	(9) —
10 - 11	—	—	—	—	—	Not Occupied	10 - 11	—	—	—	—	—
(12) 12	(12) 0.5	(12) GY / WH	(12) 2785	(12) III	(12) —	(12) Left Front Mirror Motor Fold Out Control	(12) 12	(12) 0.5	(12) GY / WH	(12) 2785	(12) V	(12) —
(13) 13	(13) 0.5	(13) WH / GN	(13) 2786	(13) II	(13) —	(13) Left Front Mirror Motor Fold In Control	(13) 13	(13) 0.5	(13) WH / GN	(13) 2786	(13) IV	(13) —
(14) 14	(14) 0.5	(14) GY / BN	(14) 2787	(14) II	(14) —	(14) Left Front Mirror Position Sensor Up [+] Down [-] Signal	(14) 14	(14) 0.5	(14) GY / BN	(14) 2787	(14) IV	(14) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(15) 15	(15) 0.5	(15) VT / BU	(15) 2788	(15) II	(15) —	(15) Left Front Mirror Motor Up [+] Down [-] Control	(15) 15	(15) 0.5	(15) VT / BU	(15) 2788	(15) IV	(15) —
(16) 16	(16) 0.5	(16) YE / BN	(16) 2789	(16) II	(16) —	(16) Left Front Mirror Motor Common Control	(16) 16	(16) 0.5	(16) YE / BN	(16) 2789	(16) IV	(16) —
(17) 17	(17) 0.5	(17) BN / BK	(17) 2790	(17) II	(17) —	(17) Left Front Mirror Motor Right [+] Left [-] Control	(17) 17	(17) 0.5	(17) BN / BK	(17) 2790	(17) IV	(17) —
(18) 18	(18) 0.5	(18) VT / RD	(18) 2791	(18) II	(18) —	(18) Left Front Mirror Position Sensor High Reference	(18) 18	(18) 0.5	(18) VT / RD	(18) 2791	(18) IV	(18) —
(19) 19	(19) 0.5	(19) WH / YE	(19) 2792	(19) II	(19) —	(19) Left Front Mirror Position Sensor Left [-] Right [+] Signal	(19) 19	(19) 0.5	(19) WH / YE	(19) 2792	(19) IV	(19) —
(20) 20	(20) 0.5	(20) WH	(20) 606	(20) II	(20) —	(20) Left Outside Rearview Mirror Heater Control	(20) 20	(20) 0.5	(20) WH	(20) 606	(20) IV	(20) —
(21) 21	(21) 0.5	(21) GN / YE	(21) 6134	(21) II	(21) —	(21) Body Control Module LIN Bus 3	(21) 21	(21) 0.5	(21) GN / YE	(21) 6134	(21) IV	(21) —
(22) 22	(22) 0.5	(22) BU / GN	(22) 614	(22) II	(22) —	(22) Seat Memory Switch Set Signal	(22) 22	(22) 0.5	(22) BU / GN	(22) 614	(22) IV	(22) —
(23) 23	(23) 0.5	(23) WH	(23) 615	(23) II	(23) —	(23) Seat Memory Switch Signal 1	(23) 23	(23) 0.5	(23) WH	(23) 615	(23) IV	(23) —
(24) 24	(24) 0.5	(24) BK / BN	(24) 673	(24) II	(24) —	(24) Left Outside Rearview Mirror Position Sensor Low Reference	(24) 24	(24) 0.5	(24) BK / BN	(24) 673	(24) IV	(24) —
(25) 25	(25) 0.35	(25) YE	(25) 6817	(25) I	(25) —	(25) LED Backlight Dimming Control 1	(25) 25	(25) 0.5	(25) YE	(25) 6817	(25) IV	(25) —
26	—	—	—	—	—	Not Occupied	26	—	—	—	—	—
(27) 27	(27) 0.5	(27) BK	(27) 1550	(27) II	(27) —	(27) Ground	(27) 27	(27) 0.5	(27) BK	(27) 1550	(27) IV	(27) —
(28) 28	(28) 0.5	(28) BK / WH	(28) 1551	(28) II	(28) —	(28) Signal Ground	(28) 28	(28) 0.5	(28) BK / WH	(28) 1551	(28) IV	(28) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(29) 29	(29) 0.5	(29) WH / VT	(29) 42 58	(29) II	(29) —	(29) Left Front Door Lock Status Signal	(29) 29	(29) 0.5	(29) WH / VT	(29) 42 58	(29) IV	(29) —
30 - 50	—	—	—	—	—	Not Occupied	30 - 50	—	—	—	—	—

X600 Front Side Door Door Wiring Harness - Right to Body Wiring Harness



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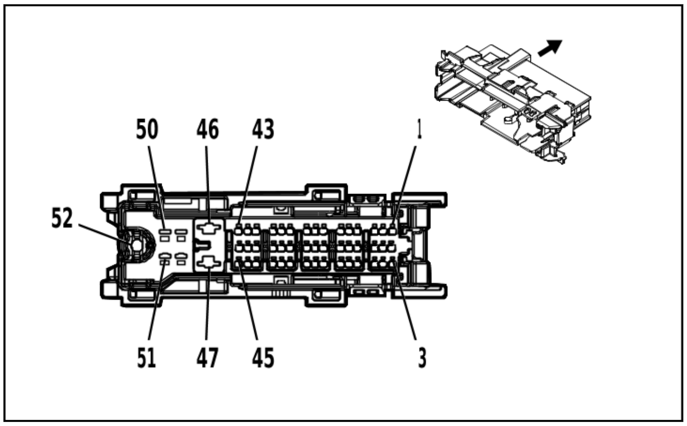

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Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 6098-8365
- Service Connector: Service by Harness - See Part Catalog
- Description: 52-Way F 1.2, 2.8, 6.3, Coaxial Series(BK)

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 13527236
- Service Connector: 13527236
- Description: 52-Way M 1.2, 2.8, 6.3, Coaxial Series(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required
III	Not required	J-35616-42 (RD)	No Tool Required
IV	Service by Cable	No Tool Required	No Tool Required
V	19301536	J-35616-43 (RD)	J-38125-11A
VI	84616651	J-35616-13 (BU)	J-38125-215A
VII	Service by Cable	No Tool Required	No Tool Required

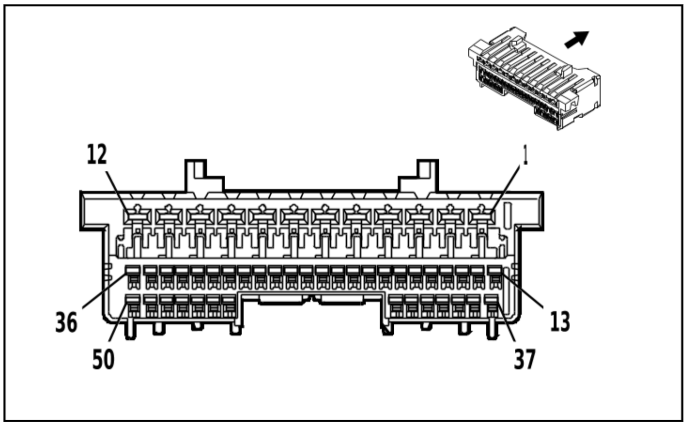
X600 Front Side Door Door Wiring Harness - Right to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1 - 4	—	—	—	—	—	Not Occupied	1 - 4	—	—	—	—	—
(5) 5	(5) 0.75	(5) YE	(5) 200	(5) II	(5) —	(5) Right Front Speaker 1 [+] Control	(5) 5	(5) 0.75	(5) YE	(5) 200	(5) VI	(5) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(6) 6	(6) 0.75	(6) YE / BK	(6) 117	(6) II	(6) —	(6) Right Front Speaker [-] Control 1	(6) 6	(6) 0.75	(6) YE / BK	(6) 117	(6) VI	(6) —
7	—	—	—	—	—	Not Occupied	7	—	—	—	—	—
(8) 8	(8) 0.5	(8) BN / OG	(8) 2134	(8) II	(8) —	(8) Right Front Side Impact Sensor Signal	(8) 8	(8) 0.5	(8) BN / OG	(8) 2134	(8) VI	(8) —
(9) 9	(9) 0.5	(9) BK / OG	(9) 6629	(9) II	(9) —	(9) Right Front Side Impact Sensor Low Reference	(9) 9	(9) 0.5	(9) BK / OG	(9) 6629	(9) VI	(9) —
(10) 10	(10) 0.5	(10) GN / YE	(10) 4303	(10) II	(10) —	(10) Passive Entry Right Antenna Signal High	(10) 10	(10) 0.35	(10) GN / YE	(10) 4303	(10) VI	(10) —
(11) 11	(11) 0.5	(11) GN / BK	(11) 4304	(11) II	(11) —	(11) Passive Entry Right Antenna Signal Low	(11) 11	(11) 0.35	(11) GN / BK	(11) 4304	(11) VI	(11) —
12	—	—	—	—	—	Not Occupied	12	—	—	—	—	—
(13) 13	(13) 0.5	(13) GN / GY	(13) 2115	(13) II	(13) —	(13) Right Turn Signal Lamp Control 2	(13) 13	(13) 0.35	(13) GN / GY	(13) 2115	(13) VI	(13) —
(14) 14	(14) 0.5	(14) GY / VT	(14) 2676	(14) II	(14) —	(14) Right Front Door Exterior Switch Unlock Signal	(14) 14	(14) 0.35	(14) GY / VT	(14) 2676	(14) VI	(14) —
(15) 15	(15) 0.75	(15) GY / BK	(15) 2680	(15) II	(15) —	(15) Lock Actuators Unlock Control 2	(15) 15	(15) 0.75	(15) GY / BK	(15) 2680	(15) VI	(15) —
(16) 16	(16) 0.75	(16) YE / GN	(16) 2682	(16) II	(16) —	(16) Right Front Door Lock Actuator Lock Control	(16) 16	(16) 0.75	(16) YE / GN	(16) 2682	(16) VI	(16) —
17 - 19	—	—	—	—	—	Not Occupied	17 - 19	—	—	—	—	—
(20) 20	(20) 0.5	(20) WH / GN	(20) 5966	(20) II	(20) —	(20) Approach Lamp Control	(20) 20	(20) 0.5	(20) WH / GN	(20) 5966	(20) VI	(20) —
21	—	—	—	—	—	Not Occupied	21	—	—	—	—	—
(22) 22	(22) 0.5	(22) BK / GY	(22) 626	(22) II	(22) —	(22) Engine Control Vehicle Sensors Low Reference 1	(22) 22	(22) 0.5	(22) BK / GY	(22) 626	(22) VI	(22) —
(23) 23	(23) 0.5	(23) BU / GY	(23) 636	(23) II	(23) —	(23) Ambient Air Temperature Sensor Signal	(23) 23	(23) 0.5	(23) BU / GY	(23) 636	(23) VI	(23) —
(24) 24	(24) 0.35	(24) YE	(24) 6817	(24) I	(24) —	(24) LED Backlight Dimming Control 1	(24) 24	(24) 0.5	(24) YE	(24) 6817	(24) VI	(24) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
25	—	—	—	—	—	Not Occupied	25	—	—	—	—	—
(26) 26	(26) 0.5	(26) BU / YE	(26) 7761	(26) II	(26) —	(26) Backup Illumination Lamp Control	(26) 26	(26) 0.35	(26) BU / YE	(26) 7761	(26) VI	(26) —
27	—	—	—	—	—	Not Occupied	27	—	—	—	—	—
(28) 28	(28) 0.5	(28) BK / WH	(28) 1451	(28) II	(28) —	(28) Signal Ground	(28) 28	(28) 0.75	(28) BK / WH	(28) 1451	(28) VI	(28) —
(29) 29	(29) 0.5	(29) GN / YE	(29) 6134	(29) II	(29) —	(29) Body Control Module LIN Bus 3	(29) 29	(29) 0.35	(29) GN / YE	(29) 6134	(29) VI	(29) —
(30) 30	(30) 0.35	(30) YE / WH	(30) 2934	(30) I	(30) —	(30) Task Lamp Control Right	(30) 30	(30) 0.35	(30) YE / WH	(30) 2934	(30) VI	(30) —
(31) 31	(31) 0.5	(31) BN / GN	(31) 4246	(31) II	(31) —	(31) Identification Lamp Control	(31) 31	(31) 0.5	(31) BN / GN	(31) 4246	(31) VI	(31) —
32 - 43	—	—	—	—	—	Not Occupied	32 - 43	—	—	—	—	—
(44) 44	(44) 0.5	(44) BK / YE	(44) 1691	(44) II	(44) —	(44) Automatic Day/Night Mirror Low Reference	(44) 44	(44) 0.35	(44) BK / YE	(44) 1691	(44) VI	(44) —
(45) 45	(45) 0.5	(45) YE / WH	(45) 1690	(45) II	(45) —	(45) Mirror Dimming Signal	(45) 45	(45) 0.35	(45) YE / WH	(45) 1690	(45) VI	(45) —
(46) 46	(46) 2.5	(46) RD / BN	(46) 4240	(46) III	(46) —	(46) Battery Positive Voltage	(46) 46	(46) 2.5	(46) RD / BN	(46) 4240	(46) V	(46) —
(47) 47	(47) 2.5	(47) BK	(47) 1350	(47) III	(47) —	(47) Ground	(47) 47	(47) 2.5	(47) BK	(47) 1350	(47) V	(47) —
48 - 51	—	—	—	—	—	Not Occupied	48 - 51	—	—	—	—	—
(52) 52	(52) —	(52) Coax Cable	(52) 4724	(52) IV	(52) —	(52) Right Sideview Camera LVDS (Low Voltage Differential Signaling) Coaxial Signal	(52) 52	(52) —	(52) Coax Cable	(52) 4724	(52) VII	(52) —

X605 Front Side Door Door Wiring Harness - Right to Front Side Door Door Lock Door Wiring Harness - Right



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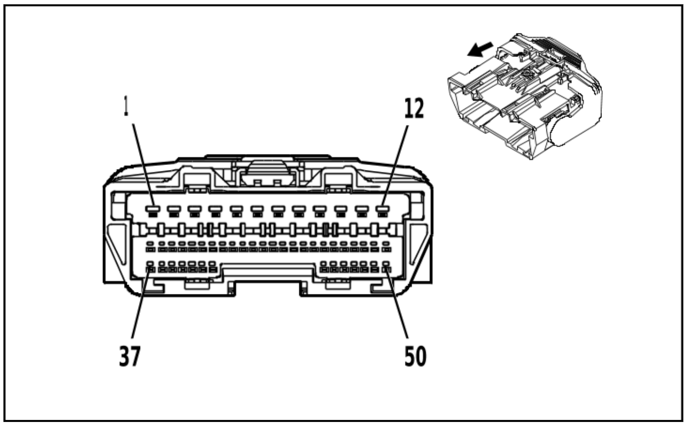


5022037

Connector Part Information

- Harness Type: Front Side Door Door Wiring Harness - Right
- OEM Connector: 35283943
- Service Connector: Service by Harness - See Part Catalog
- Description: 50-Way F 1.2, 2.8 OCS Series(BK)

Connector Part Information

- Harness Type: Front Side Door Door Lock Door Wiring Harness - Right
- OEM Connector: 33390111
- Service Connector: Service by Harness - See Part Catalog
- Description: 50-Way M 1.2, 2.8 OCS Series(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	J-35616-16 (L-GN)	No Tool Required
III	Not required	J-35616-4A (PU)	No Tool Required
IV	Not required	J-35616-17 (L-GN)	No Tool Required
V	Not required	J-35616-5 (PU)	No Tool Required

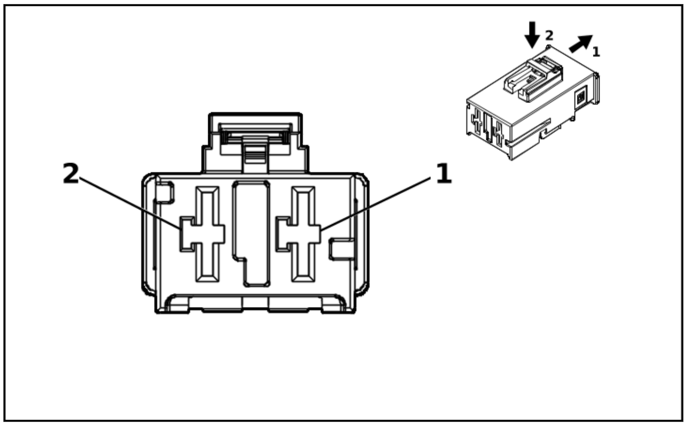
X605 Front Side Door Door Wiring Harness - Right to Front Side Door Door Lock Door Wiring Harness - Right

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) RD / BN	(1) 4240	(1) III	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 2.5	(1) RD / BN	(1) 4240	(1) V	(1) —
(2) 2	(2) 0.5	(2) GN	(2) 1184	(2) III	(2) —	(2) Window Switch Right Front Up Signal	(2) 2	(2) 0.5	(2) GN	(2) 1184	(2) V	(2) —
(3) 3	(3) 0.5	(3) GY	(3) 1761	(3) III	(3) —	(3) Right Side Object Detection LED Control	(3) 3	(3) 0.35	(3) GY	(3) 1761	(3) V	(3) —
4	—	—	—	—	—	Not Occupied	4	—	—	—	—	—
(5) 5	(5) 0.5	(5) VT / GY	(5) 2765	(5) III	(5) —	(5) Window Switch Right Front Express Signal	(5) 5	(5) 0.5	(5) VT / GY	(5) 2765	(5) V	(5) —
6 - 7	—	—	—	—	—	Not Occupied	6 - 7	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(8) 8	(8) 0.5	(8) YE / WH	(8) 2793	(8) III	(8) —	(8) Right Front Mirror Motor Fold Out Control	(8) 8	(8) 0.5	(8) YE / WH	(8) 2793	(8) V	(8) —
(9) 9	(9) 0.5	(9) BU / GY	(9) 2794	(9) III	(9) —	(9) Right Front Mirror Motor Fold In Control	(9) 9	(9) 0.5	(9) BU / GY	(9) 2794	(9) V	(9) —
(10) 10	(10) 2.5	(10) BK	(10) 1350	(10) III	(10) —	(10) Ground	(10) 10	(10) 2.5	(10) BK	(10) 1350	(10) V	(10) —
(11) 11	(11) 2	(11) GN / GY	(11) 666	(11) III	(11) —	(11) Right Front Window Motor Up Control	(11) 11	(11) 2.5	(11) GN / GY	(11) 666	(11) V	(11) —
(12) 12	(12) 2	(12) YE / BU	(12) 667	(12) III	(12) —	(12) Right Front Window Motor Down Control	(12) 12	(12) 2.5	(12) YE / BU	(12) 667	(12) V	(12) —
(13) 13	(13) 0.5	(13) GN / BK	(13) 2798	(13) II	(13) —	(13) Right Front Mirror Motor Right [+] Left [-] Control	(13) 13	(13) 0.5	(13) GN / BK	(13) 2798	(13) IV	(13) —
(14) 14	(14) 0.5	(14) YE / RD	(14) 2799	(14) II	(14) —	(14) Right Front Mirror Position Sensor High Reference	(14) 14	(14) 0.5	(14) YE / RD	(14) 2799	(14) IV	(14) —
(15) 15	(15) 0.5	(15) VT / WH	(15) 2800	(15) II	(15) —	(15) Right Front Mirror Position Sensor Left [-] Right [+] Signal	(15) 15	(15) 0.5	(15) VT / WH	(15) 2800	(15) IV	(15) —
(16) 16	(16) 0.5	(16) BN	(16) 5295	(16) II	(16) —	(16) Window Switch Right Front Down Signal	(16) 16	(16) 0.5	(16) BN	(16) 5295	(16) IV	(16) —
(17) 17	(17) 0.5	(17) BN / VT	(17) 607	(17) II	(17) —	(17) Right Outside Rearview Mirror Heater Control	(17) 17	(17) 0.5	(17) BN / VT	(17) 607	(17) IV	(17) —
(18) 18	(18) 0.5	(18) GN / YE	(18) 6134	(18) II	(18) —	(18) Body Control Module LIN Bus 3	(18) 18	(18) 0.5	(18) GN / YE	(18) 6134	(18) IV	(18) —
(19) 19	(19) 0.5	(19) BN / GN	(19) 10203	(19) II	(19) —	(19) Right Front Mirror Motor Extend Control	(19) 19	(19) 0.5	(19) BN / GN	(19) 10203	(19) IV	(19) —
(20) 20	(20) 0.5	(20) VT	(20) 10204	(20) II	(20) —	(20) Right Front Mirror Motor Retract Control	(20) 20	(20) 0.5	(20) VT	(20) 10204	(20) IV	(20) —
(21) 21	(21) 0.5	(21) BK / GN	(21) 675	(21) II	(21) —	(21) Right Outside Rearview Mirror Position Sensor Low Reference	(21) 21	(21) 0.5	(21) BK / GN	(21) 675	(21) IV	(21) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(22) 22	(22) 0.35	(22) YE	(22) 6817	(22) I	(22) —	(22) LED Backlight Dimming Control 1	(22) 22	(22) 0.5	(22) YE	(22) 6817	(22) IV	(22) —
23 - 46	—	—	—	—	—	Not Occupied	23 - 46	—	—	—	—	—
(47) 47	(47) 0.5	(47) GY	(47) 746	(47) II	(47) —	(47) Right Front Door Ajar Switch Signal	(47) 47	(47) 0.5	(47) GY	(47) 746	(47) IV	(47) —
(48) 48	(48) 0.5	(48) BU / YE	(48) 2795	(48) II	(48) —	(48) Right Front Mirror Position Sensor Up [+] Down [-] Signal	(48) 48	(48) 0.5	(48) BU / YE	(48) 2795	(48) IV	(48) —
(49) 49	(49) 0.5	(49) YE / VT	(49) 2796	(49) II	(49) —	(49) Right Front Mirror Motor Up [+] Down [-] Control	(49) 49	(49) 0.5	(49) YE / VT	(49) 2796	(49) IV	(49) —
(50) 50	(50) 0.5	(50) WH	(50) 2797	(50) II	(50) —	(50) Right Front Mirror Motor Common Control	(50) 50	(50) 0.5	(50) WH	(50) 2797	(50) IV	(50) —

X630 Battery Positive Cable Extension Cable to Auxiliary Fuse Block Wiring Harness



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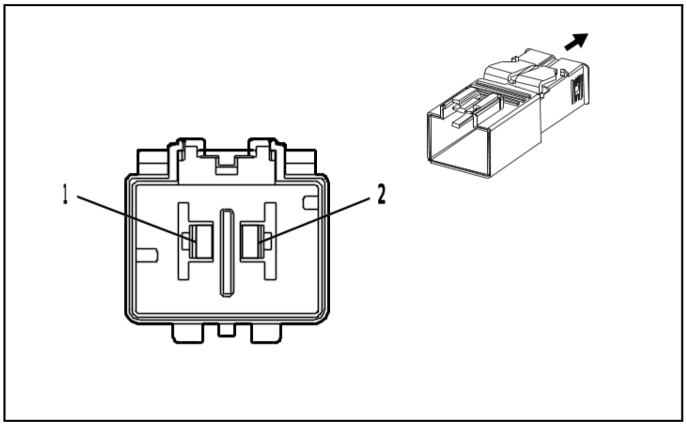
Connector Part Information
- Harness Type: Battery Positive Cable Extension Cable
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F



4891120

Connector Part Information
- Harness Type: Auxiliary Fuse Block Wiring Harness
- OEM Connector: 2317373-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 9.5 MCON-LL Series(BK)

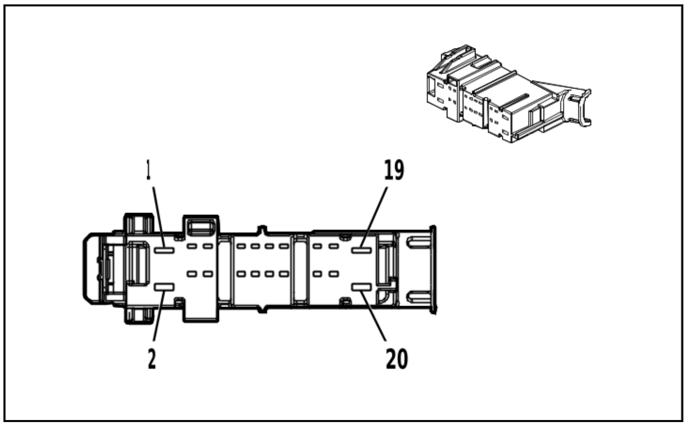
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required
II	Not required	J-35616-21 (RD)	No Tool Required

X630 Battery Positive Cable Extension Cable to Auxiliary Fuse Block Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 10	(1) RD / VT	(1) 542	(1) I	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 10	(1) RD / VT	(1) 542	(1) II	(1) —
2	—	—	—	—	—	Not Occupied	2	—	—	—	—	—

X700 Rear Side Door Door Wiring Harness - Left to Body Wiring Harness



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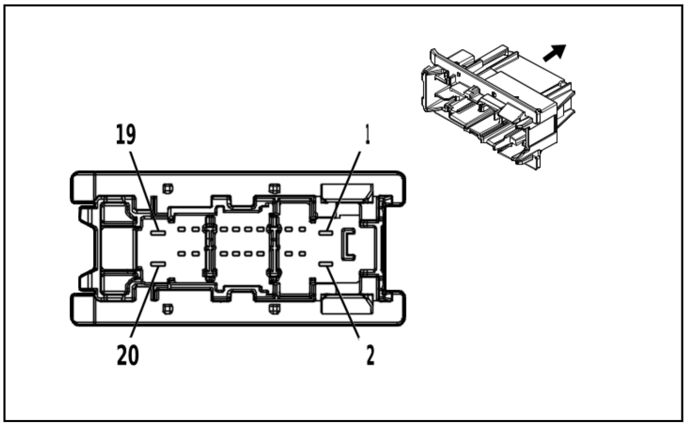


4663657

Connector Part Information
- Harness Type: Rear Side Door Door Wiring Harness - Left
- OEM Connector: 6098-8196
- Service Connector: Service by Harness - See Part Catalog
- Description: 20-Way F 1.2 MCON, 2.8 MCP Series(BK)

Connector Part Information
- Harness Type: Body Wiring Harness
- OEM Connector: 6098-8887
- Service Connector: 13527239
- Description: 20-Way M 1.2 MCON, 2.8 MCP Series(BK)

Terminal Part Information

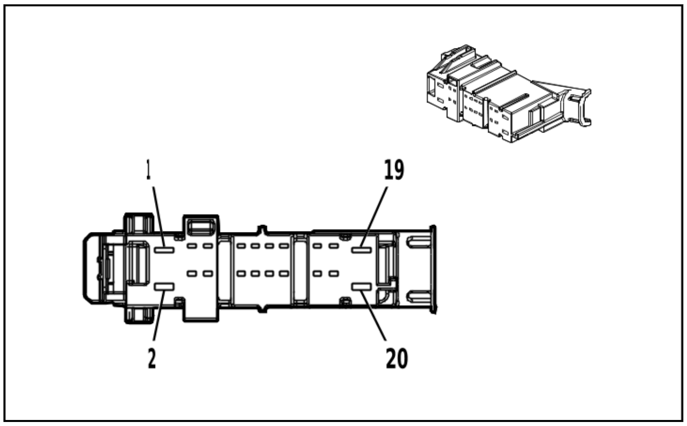
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-35 (VT)	No Tool Required
III	13586064	J-35616-5 (PU)	J-38125-212
IV	84616651	J-35616-13 (BU)	J-38125-215A
V	84726946	J-35616-13 (BU)	J-38125-215A

X700 Rear Side Door Door Wiring Harness - Left to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) RD / BU	(1) 3240	(1) II	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 2.5	(1) RD / BU	(1) 3240	(1) III	(1) —
2 - 5	—	—	—	—	—	Not Occupied	2 - 5	—	—	—	—	—
(6) 6	(6) 0.75	(6) WH	(6) 2679	(6) I	(6) —	(6) Lock Actuators Unlock Control 1	(6) 6	(6) 0.75	(6) WH	(6) 2679	(6) IV	(6) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(7) 7	(7) 0.75	(7) BU / YE	(7) 1091	(7) I	(7) —	(7) Left Rear Door Lock Actuator Lock Control	(7) 7	(7) 0.75	(7) BU / YE	(7) 1091	(7) IV	(7) —
8	—	—	—	—	—	Not Occupied	8	—	—	—	—	—
(9) 9	(9) 0.5	(9) BK / OG	(9) 6623	(9) I	(9) —	(9) Left Rear Side Impact Sensor Low Reference	(9) 9	(9) 0.5	(9) BK / OG	(9) 6623	(9) IV	(9) —
10	—	—	—	—	—	Not Occupied	10	—	—	—	—	—
(11) 11	(11) 0.5	(11) OG / BU	(11) 6622	(11) I	(11) —	(11) Left Rear Side Impact Sensor Signal	(11) 11	(11) 0.5	(11) OG / BU	(11) 6622	(11) IV	(11) —
(12) 12	(12) 0.5	(12) GN / GY	(12) 6135	(12) I	(12) —	(12) Body Control Module LIN Bus 4	(12) 12	(12) 0.35	(12) GN / GY	(12) 6135	(12) IV	(12) —
13 - 16	—	—	—	—	—	Not Occupied	13 - 16	—	—	—	—	—
(17) 17	(17) 0.75	(17) GN	(17) 199	(17) I	(17) —	(17) Left Rear Speaker [+] Control (17) Left Rear Speaker [+] Control	(17) 17	(17) 1.5 (17) 0.75	(17) GN (17) GN	(17) 199 (17) 199	(17) V (17) IV	(17) UQS (17) UQA/ UQF
(18) 18	(18) 0.75	(18) GN / BK	(18) 116	(18) I	(18) —	(18) Left Rear Speaker [-] Control (18) Left Rear Speaker [-] Control	(18) 18	(18) 1.5 (18) 0.75	(18) GN / BK (18) GN / BK	(18) 116 (18) 116	(18) V (18) IV	(18) UQS (18) UQA/ UQF
19	—	—	—	—	—	Not Occupied	19	—	—	—	—	—
(20) 20	(20) 2.5	(20) BK	(20) 1550	(20) II	(20) —	(20) Ground	(20) 20	(20) 2.5	(20) BK	(20) 1550	(20) III	(20) —

X800 Rear Side Door Door Wiring Harness - Right to Body Wiring Harness



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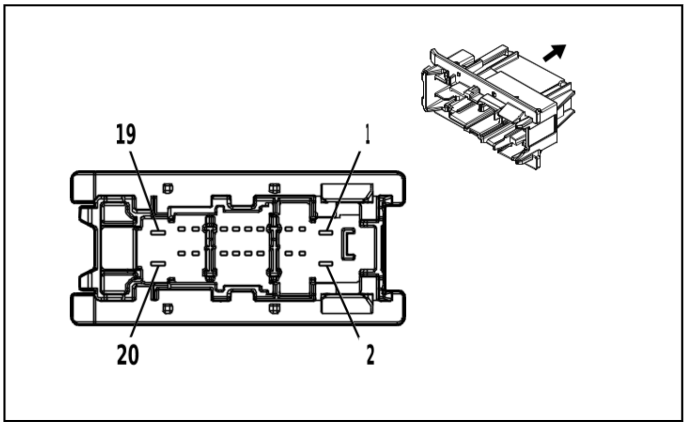


4663657

Connector Part Information

- Harness Type: Rear Side Door Door Wiring Harness - Right
- OEM Connector: 6098-8196
- Service Connector: Service by Harness - See Part Catalog
- Description: 20-Way F 1.2 MCON, 2.8 MCP Series(BK)

Connector Part Information

- Harness Type: Body Wiring Harness
- OEM Connector: 6098-8887
- Service Connector: 13527239
- Description: 20-Way M 1.2 MCON, 2.8 MCP Series(BK)

Terminal Part Information

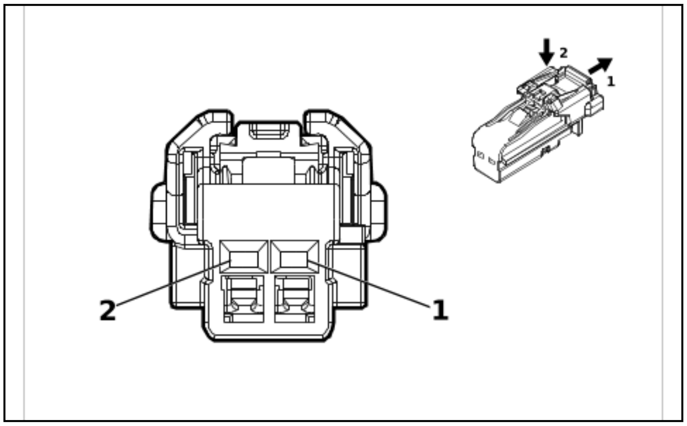
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-35 (VT)	No Tool Required
III	13586064	J-35616-5 (PU)	J-38125-212
IV	84616651	J-35616-13 (BU)	J-38125-215A
V	84726946	J-35616-13 (BU)	J-38125-215A

X800 Rear Side Door Door Wiring Harness - Right to Body Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) YE / BK	(1) 4840	(1) II	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 2.5	(1) RD / GY	(1) 4840	(1) III	(1) —
2 - 5	—	—	—	—	—	Not Occupied	2 - 5	—	—	—	—	—
(6) 6	(6) 0.75	(6) GY / BK	(6) 2680	(6) I	(6) —	(6) Lock Actuators Unlock Control 2	(6) 6	(6) 0.75	(6) GY / BK	(6) 2680	(6) IV	(6) —
(7) 7	(7) 0.75	(7) VT / WH	(7) 1094	(7) I	(7) —	(7) Right Rear Door Lock Actuator Lock Control	(7) 7	(7) 0.75	(7) VT / WH	(7) 1094	(7) IV	(7) —
8	—	—	—	—	—	Not Occupied	8	—	—	—	—	—
(9) 9	(9) 0.5	(9) BK / OG	(9) 6627	(9) I	(9) —	(9) Right Rear Side Impact Sensor Low Reference	(9) 9	(9) 0.5	(9) BK / OG	(9) 6627	(9) IV	(9) —
10	—	—	—	—	—	Not Occupied	10	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(11) 11	(11) 0.5	(11) OG / WH	(11) 6626	(11) I	(11) —	(11) Right Rear Side Impact Sensor Signal	(11) 11	(11) 0.5	(11) OG / WH	(11) 6626	(11) IV	(11) —
(12) 12	(12) 0.5	(12) GN / GY	(12) 6135	(12) I	(12) —	(12) Body Control Module LIN Bus 4	(12) 12	(12) 0.35	(12) GN / GY	(12) 6135	(12) IV	(12) —
13 - 16	—	—	—	—	—	Not Occupied	13 - 16	—	—	—	—	—
(17) 17	(17) 0.75	(17) WH	(17) 46	(17) I	(17) —	(17) Right Rear Speaker [+] Control (17) Right Rear Speaker [+] Control	(17) 17	(17) 1.5 (17) 0.75	(17) WH (17) WH	(17) 46 (17) 46	(17) V (17) IV	(17) UQS (17) UQA/ UQF
(18) 18	(18) 0.75	(18) BU / BK	(18) 115	(18) I	(18) —	(18) Right Rear Speaker [-] Control (18) Right Rear Speaker [-] Control	(18) 18	(18) 1.5 (18) 0.75	(18) BU / BK (18) BU / BK	(18) 115 (18) 115	(18) V (18) IV	(18) UQS (18) UQA/ UQF
19	—	—	—	—	—	Not Occupied	19	—	—	—	—	—
(20) 20	(20) 2.5	(20) BK	(20) 1350	(20) II	(20) —	(20) Ground	(20) 20	(20) 2.5	(20) BK	(20) 1350	(20) III	(20) —

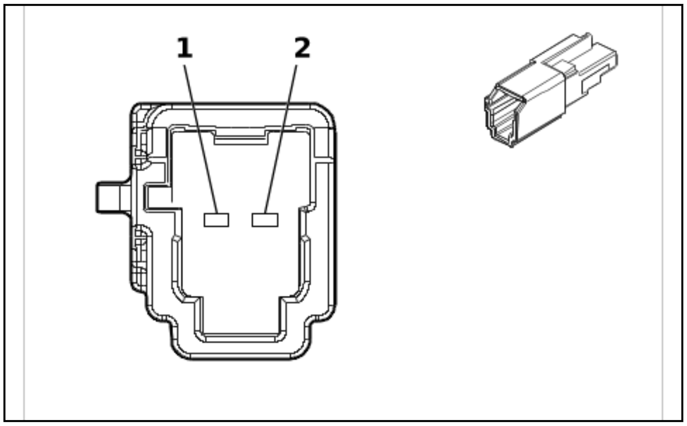
X850 Roof Wiring Harness to Instrument Panel Wiring Harness



4115691

Connector Part Information

- Harness Type: Roof Wiring Harness
- OEM Connector: 6098-8988
- Service Connector: 87816612
- Description: 2-Way F 1.2 MCON Series(BK)



6529124

Connector Part Information

- Harness Type: Instrument Panel Wiring Harness
- OEM Connector: 6099-0610
- Service Connector: 85725003
- Description: 2-Way M 1.2 MBS Series(BK)

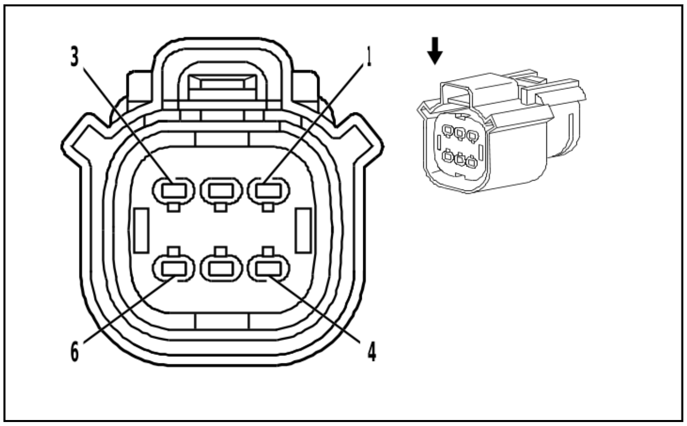
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-17 (L-GN)	No Tool Required

X850 Roof Wiring Harness to Instrument Panel Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1050	(1) I	(1) —	(1) Ground	(1) 1	(1) 0.5	(1) BK	(1) 1050	(1) II	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) I	(2) —	(2) Identification Lamp Control	(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) II	(2) —

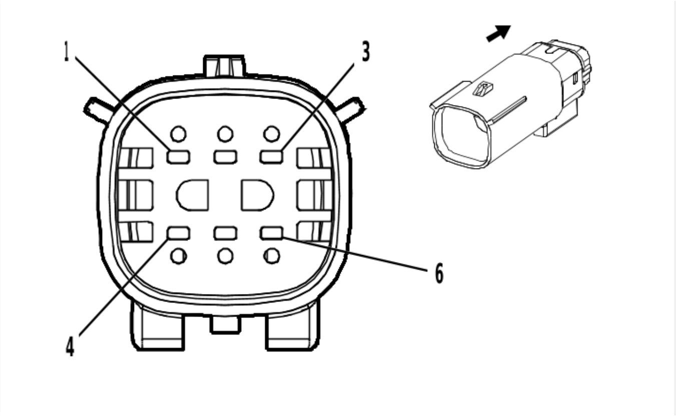
X910A Tail Lamp Wiring Harness to Chassis Wiring Harness - Chassis Cab



1664625

Connector Part Information

- Harness Type: Tail Lamp Wiring Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F



1986159

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 33482-3646
- Service Connector: 19367742
- Description: 6-Way M 1.5 MX Series, Sealed(BK)

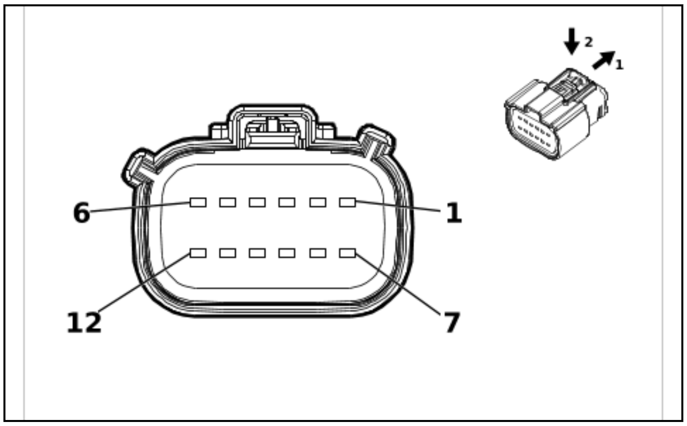
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required
II	Not required	J-35616-3 (GY)	No Tool Required

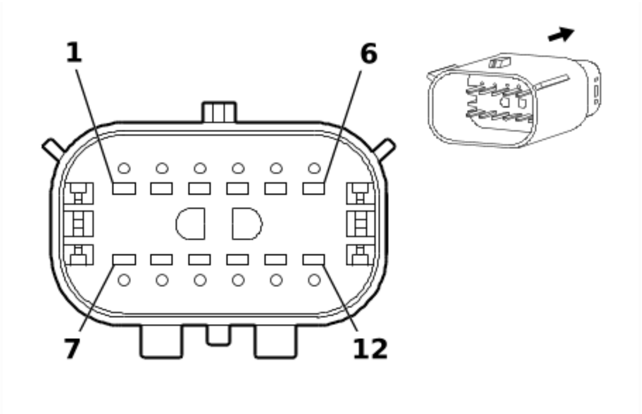
X910A Tail Lamp Wiring Harness to Chassis Wiring Harness - Chassis Cab

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN / BU	(1) 6993	(1) I	(1) —	(1) Left Rear Park Lamp Control	(1) 1	(1) 0.75	(1) BN / BU	(1) 6993	(1) II	(1) —
2 - 3	—	—	—	—	—	Not Occupied	2 - 3	—	—	—	—	—
(4) 4	(4) 0.5	(4) GN / WH	(4) 24	(4) I	(4) —	(4) Backup Lamp Control	(4) 4	(4) 0.5	(4) GN / WH	(4) 24	(4) II	(4) —
(5) 5	(5) 0.75	(5) BU / WH	(5) 1334	(5) I	(5) —	(5) Left Rear Turn Signal Lamp Control 2	(5) 5	(5) 0.75	(5) BU / WH	(5) 1334	(5) II	(5) —
(6) 6	(6) 1	(6) BK / WH	(6) 1951	(6) I	(6) —	(6) Signal Ground	(6) 6	(6) 1	(6) BK / WH	(6) 1951	(6) II	(6) —

X910A Tail Lamp Wiring Harness to Chassis Wiring Harness - Pickup



2871862



1825167

Connector Part Information
- Harness Type: Tail Lamp Wiring Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way F

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 33482-6201
- Service Connector: 19369242
- Description: 12-Way M 1.5 MX Series, Sealed(BK)

Terminal Part Information

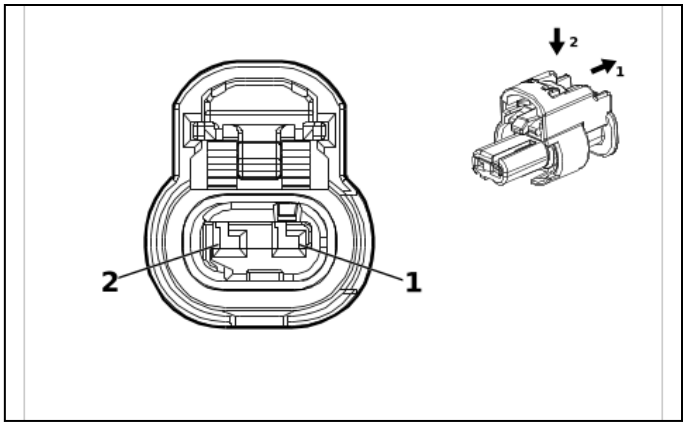
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required
II	86800300	J-35616-3 (GY)	J-38125-217

X910A Tail Lamp Wiring Harness to Chassis Wiring Harness - Pickup

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 1	(1) BK	(1) 1951	(1) I	(1) —	(1) Signal Ground	(1) 1	(1) 1	(1) BK	(1) 1951	(1) II	(1) —
(2) 2	(2) 0.5	(2) BN	(2) 640	(2) I	(2) —	(2) Battery Positive Voltage	(2) 2	(2) 0.5	(2) RD / WH	(2) 640	(2) II	(2) —
(3) 3	(3) 0.75	(3) BU	(3) 7542	(3) I	(3) —	(3) Left Rear Stop Lamp Control	(3) 3	(3) 0.75	(3) GY / YE	(3) 7542	(3) II	(3) —
(4) 4	(4) 0.75	(4) BN	(4) 6993	(4) I	(4) —	(4) Left Rear Park Lamp Control	(4) 4	(4) 0.75	(4) BN / BU	(4) 6993	(4) II	(4) —
(5) 5	(5) 0.75	(5) GN	(5) 1334	(5) I	(5) —	(5) Left Rear Turn Signal Lamp Control 2	(5) 5	(5) 0.75	(5) BU / WH	(5) 1334	(5) II	(5) —
(6) 6	(6) 0.75	(6) BK	(6) 1951	(6) I	(6) —	(6) Signal Ground	(6) 6	(6) 0.75	(6) BK	(6) 1951	(6) II	(6) —
(7) 7	(7) 0.5	(7) GN	(7) 24	(7) I	(7) —	(7) Backup Lamp Control	(7) 7	(7) 0.5	(7) GN / WH	(7) 24	(7) II	(7) —
(8) 8	(8) 0.5	(8) YE	(8) 2024	(8) I	(8) —	(8) Animation Lighting Control	(8) 8	(8) 0.5	(8) YE / GN	(8) 2024	(8) II	(8) —
(9) 9	(9) 0.5	(9) BU	(9) 7762	(9) I	(9) —	(9) Cargo Lamp Control	(9) 9	(9) 0.5	(9) GY / BU	(9) 7762	(9) II	(9) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(10) 10	(10) 0.75	(10) BU / VT	(10) 1335	(10) I	(10) —	(10) Right Rear Turn Signal Lamp Control 2	(10) 10	(10) 0.75	(10) BU / VT	(10) 1335	(10) II	(10) —
(11) 11	(11) 0.5	(11) BN / GN	(11) 4246	(11) I	(11) —	(11) Identification Lamp Control	(11) 11	(11) 0.5	(11) BN / GN	(11) 4246	(11) II	(11) —
12	—	—	—	—	—	Not Occupied	12	—	—	—	—	—

X910C Rear License Plate Lamp Wiring Harness Extension Harness - Left to Tail Lamp Wiring Harness



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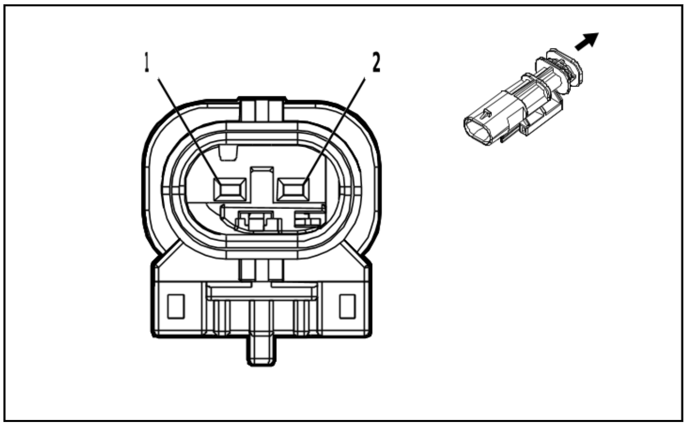


4569729

Connector Part Information

- Harness Type: Rear License Plate Lamp Wiring Harness Extension Harness - Left
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

Connector Part Information

- Harness Type: Tail Lamp Wiring Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M (BK)

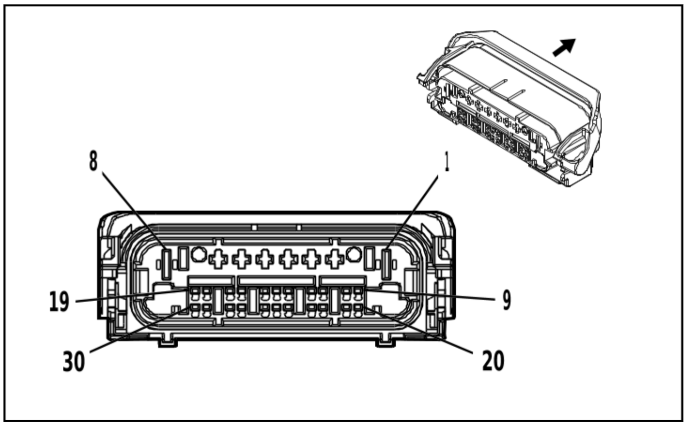
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	No Tool Required	No Tool Required

X910C Rear License Plate Lamp Wiring Harness Extension Harness - Left to Tail Lamp Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1951	(1) I	(1) —	(1) Signal Ground	(1) 1	(1) 0.5	(1) BK	(1) 1850	(1) II	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) I	(2) —	(2) Identification Lamp Control	(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) II	(2) —

X918 Endgate Wiring Harness to Chassis Wiring Harness



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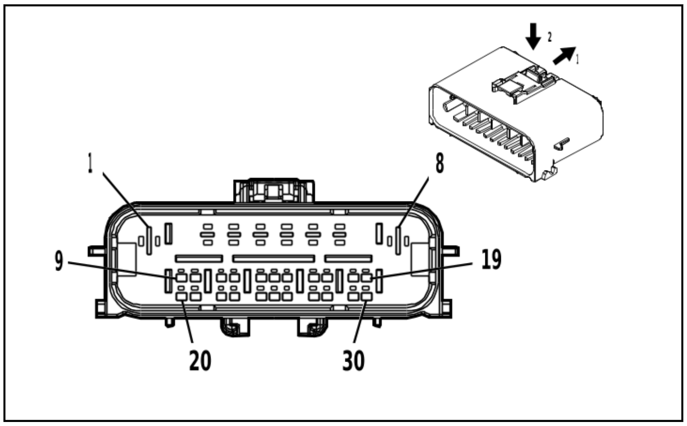


4817393

Connector Part Information

- Harness Type: Endgate Wiring Harness
- OEM Connector: 35573111
- Service Connector: Service by Harness - See Part Catalog
- Description: 30-Way F 1.2 MCON, 2.8, 6.3 MCP Series, Sealed(BK)

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13515618
- Service Connector: 19371177
- Description: 30-Way M 1.2 MCON, 2.8, 6.3 MCP Series, Sealed(BK)

Terminal Part Information

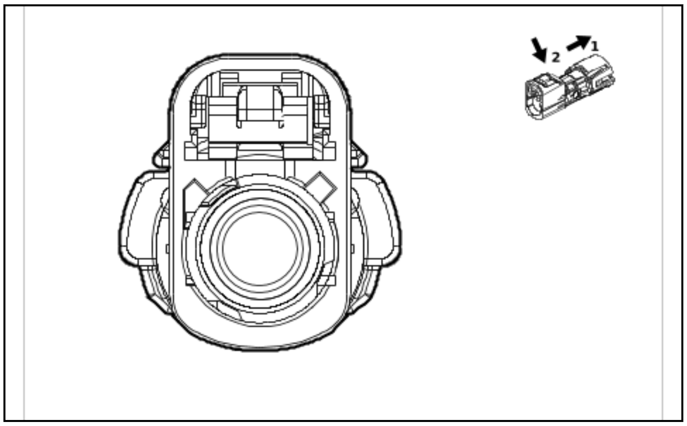
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-16 (L-GN)	No Tool Required
II	Not required	J-35616-35 (VT)	No Tool Required
III	Not required	J-35616-4A (PU)	No Tool Required
IV	13578827	J-35616-5 (PU)	J-38125-36
V	19330704	J-35616-13 (BU)	J-38125-215A

X918 Endgate Wiring Harness to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1	—	—	—	—	—	Not Occupied	1	—	—	—	—	—
(2) 2	(2) 2.5	(2) RD / VT	(2) 4442	(2) II	(2) —	(2) Primary Fused Battery Positive Voltage	(2) 2	(2) 2.5	(2) RD / VT	(2) 4442	(2) IV	(2) —
(3) 3	(3) 2.5	(3) BK	(3) 1850	(3) II	(3) —	(3) Ground	(3) 3	(3) 2.5	(3) BK	(3) 1850	(3) IV	(3) —
(4) 4	(4) 1	(4) VT	(4) 7725	(4) III	(4) —	(4) Minor Endgate Motor Control	(4) 4	(4) 1	(4) VT	(4) 7725	(4) IV	(4) —
(5) 5	(5) 1	(5) YE / BK	(5) 7730	(5) III	(5) —	(5) Major Endgate Motor Low Reference	(5) 5	(5) 1	(5) YE / BK	(5) 7730	(5) IV	(5) —
(6) 6	(6) 1	(6) GN	(6) 1299	(6) III	(6) —	(6) Major Endgate Motor Control	(6) 6	(6) 1	(6) GN	(6) 1299	(6) IV	(6) —
7 - 8	—	—	—	—	—	Not Occupied	7 - 8	—	—	—	—	—

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(9) 9	(9) 0.5	(9) WH / VT	(9) 1430	(9) I	(9) —	(9) Exterior Courtesy Lamp Control	(9) 9	(9) 0.5	(9) WH / VT	(9) 1430	(9) V	(9) —
(10) 10	(10) 0.5	(10) YE	(10) 7294	(10) I	(10) —	(10) Minor Endgate Release Switch Discrete Signal Exterior	(10) 10	(10) 0.5	(10) YE	(10) 7294	(10) V	(10) —
(11) 11	(11) 0.75	(11) YE / BU	(11) 7295	(11) I	(11) —	(11) Left Minor Endgate Ajar Signal	(11) 11	(11) 0.75	(11) YE / BU	(11) 7295	(11) V	(11) —
12 - 17	—	—	—	—	—	Not Occupied	12 - 17	—	—	—	—	—
(18) 18	(18) 0.5	(18) BU / VT	(18) 4101	(18) I	(18) —	(18) AUTOSAR CAN Bus [+] 4 Serial Data	(18) 18	(18) 0.5	(18) BU / VT	(18) 4101	(18) V	(18) —
(19) 19	(19) 0.5	(19) WH	(19) 4100	(19) I	(19) —	(19) AUTOSAR CAN Bus [-] 4 Serial Data	(19) 19	(19) 0.5	(19) WH	(19) 4100	(19) V	(19) —
(20) 20	(20) 0.5	(20) YE	(20) 1144	(20) I	(20) —	(20) Endgate Release Switch Discrete Signal Exterior	(20) 20	(20) 0.5	(20) YE	(20) 1144	(20) V	(20) —
(21) 21	(21) 0.5	(21) GY	(21) 7292	(21) I	(21) —	(21) Major Endgate Release Switch Signal Exterior	(21) 21	(21) 0.5	(21) GY	(21) 7292	(21) V	(21) —
(22) 22	(22) 0.5	(22) WH	(22) 4100	(22) I	(22) —	(22) AUTOSAR CAN Bus [-] 4 Serial Data	(22) 22	(22) —	(22) —	(22) —	(22) —	(22) —
(23) 23	(23) 0.5	(23) BU / VT	(23) 4101	(23) I	(23) —	(23) AUTOSAR CAN Bus [+] 4 Serial Data	(23) 23	(23) —	(23) —	(23) —	(23) —	(23) —
24 - 28	—	—	—	—	—	Not Occupied	24 - 28	—	—	—	—	—
(29) 29	(29) 0.5	(29) WH	(29) 4100	(29) I	(29) —	(29) AUTOSAR CAN Bus [-] 4 Serial Data	(29) 29	(29) 0.5	(29) WH	(29) 4100	(29) V	(29) —
(30) 30	(30) 0.5	(30) BU / VT	(30) 4101	(30) I	(30) —	(30) AUTOSAR CAN Bus [+] 4 Serial Data	(30) 30	(30) 0.5	(30) BU / VT	(30) 4101	(30) V	(30) —

X919 Endgate Wiring Harness to Chassis Wiring Harness



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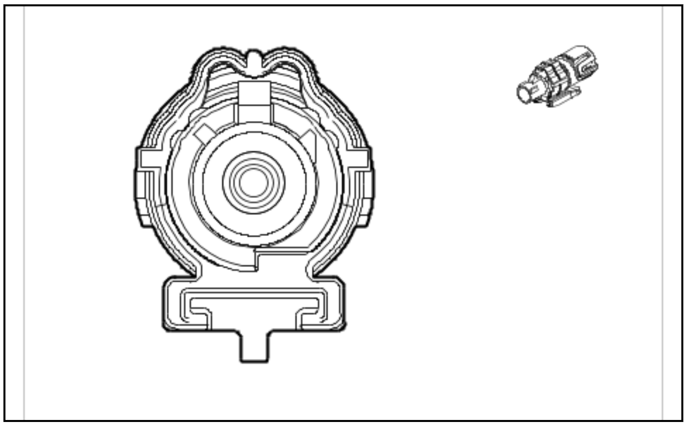


5757466

Connector Part Information

- Harness Type: Endgate Wiring Harness COAX
- OEM Connector: 35187033
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F Coax Type(WH)

Connector Part Information

- Harness Type: Chassis Wiring Harness COAX
- OEM Connector: 33338240
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way M Coax Type, Sealed(WH)

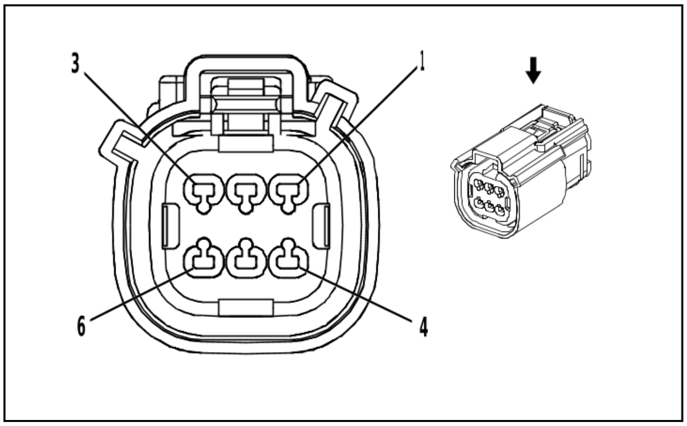
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

X919 Endgate Wiring Harness to Chassis Wiring Harness

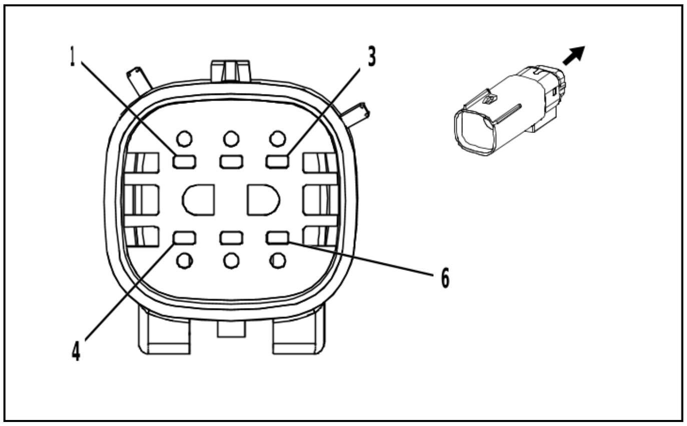
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
—	—	Coax Cable	—	I	—	Rear Vision Camera Coaxial Video Signal	—	—	Coax Cable	—	I	—

X920A Tail Lamp Wiring Harness to Chassis Wiring Harness - Chassis Cab



3225042

Connector Part Information
- Harness Type: Tail Lamp Wiring Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way F



3225221

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 33482-3647
- Service Connector: 19370461
- Description: 6-Way M 1.5 MX Series, Sealed(GY)

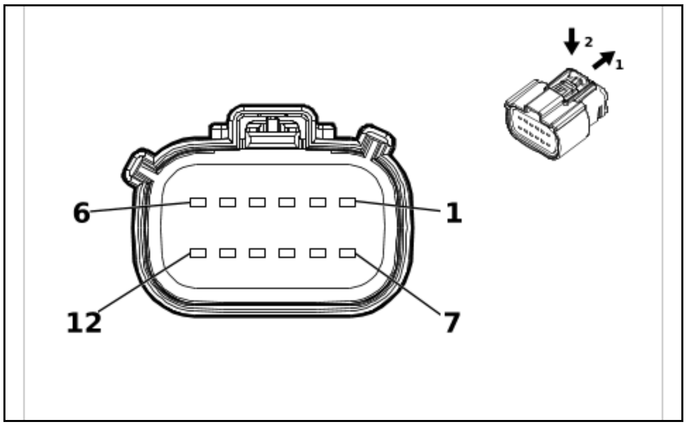
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required
II	Not required	J-35616-3 (GY)	No Tool Required

X920A Tail Lamp Wiring Harness to Chassis Wiring Harness - Chassis Cab

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.75	(1) BN	(1) 6995	(1) I	(1) —	(1) Right Rear Park Lamp Control	(1) 1	(1) 0.75	(1) BN / GY	(1) 6995	(1) II	(1) —
2 - 3	—	—	—	—	—	Not Occupied	2 - 3	—	—	—	—	—
(4) 4	(4) 0.5	(4) GN	(4) 24	(4) I	(4) —	(4) Backup Lamp Control	(4) 4	(4) 0.5	(4) GN / WH	(4) 24	(4) II	(4) —
(5) 5	(5) 0.75	(5) GN	(5) 1335	(5) I	(5) —	(5) Right Rear Turn Signal Lamp Control 2	(5) 5	(5) 0.75	(5) BU / VT	(5) 1335	(5) II	(5) —
(6) 6	(6) 1	(6) BK	(6) 1850	(6) I	(6) —	(6) Ground	(6) 6	(6) 1	(6) BK	(6) 1850	(6) II	(6) —

X920A Tail Lamp Wiring Harness to Chassis Wiring Harness - Pickup



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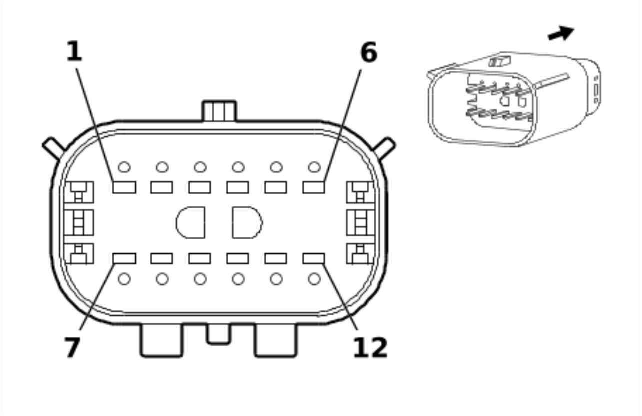


1825167

Connector Part Information
- Harness Type: Tail Lamp Wiring Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way F

Connector Part Information
- Harness Type: Chassis Wiring Harness
- OEM Connector: 33482-6201
- Service Connector: 19369242
- Description: 12-Way M 1.5 MX Series, Sealed(BK)

Terminal Part Information

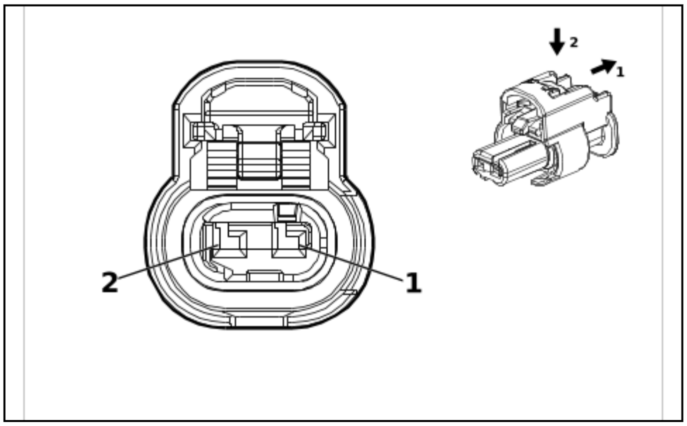
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required
II	86800300	J-35616-3 (GY)	J-38125-217

X920A Tail Lamp Wiring Harness to Chassis Wiring Harness - Pickup

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 1	(1) BK	(1) 1850	(1) I	(1) —	(1) Ground	(1) 1	(1) 1	(1) BK	(1) 1850	(1) II	(1) —
(2) 2	(2) 0.5	(2) RD / WH	(2) 6440	(2) I	(2) —	(2) Battery Positive Voltage	(2) 2	(2) 0.5	(2) RD / WH	(2) 6440	(2) II	(2) —
(3) 3	(3) 0.75	(3) BU	(3) 7541	(3) I	(3) —	(3) Right Rear Stop Lamp Control	(3) 3	(3) 0.75	(3) WH / YE	(3) 7541	(3) II	(3) —
(4) 4	(4) 0.75	(4) GY	(4) 6995	(4) I	(4) —	(4) Right Rear Park Lamp Control	(4) 4	(4) 0.75	(4) BN / GY	(4) 6995	(4) II	(4) —
(5) 5	(5) 0.75	(5) BU / VT	(5) 1335	(5) I	(5) —	(5) Right Rear Turn Signal Lamp Control 2	(5) 5	(5) 0.75	(5) BU / VT	(5) 1335	(5) II	(5) —
(6) 6	(6) 0.75	(6) WH / BK	(6) 7544	(6) I	(6) —	(6) Right Rear Turn Signal Lamp Feedback Signal	(6) 6	(6) 0.75	(6) WH / BK	(6) 7544	(6) II	(6) —
(7) 7	(7) 0.5	(7) GN	(7) 24	(7) I	(7) —	(7) Backup Lamp Control	(7) 7	(7) 0.5	(7) GN / WH	(7) 24	(7) II	(7) —
(8) 8	(8) 0.5	(8) YE	(8) 2024	(8) I	(8) —	(8) Animation Lighting Control	(8) 8	(8) 0.5	(8) YE / GN	(8) 2024	(8) II	(8) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(9) 9	(9) 0.5	(9) BU	(9) 7762	(9) I	(9) —	(9) Cargo Lamp Control	(9) 9	(9) 0.5	(9) GY / BU	(9) 7762	(9) II	(9) —
(10) 10	(10) 0.75	(10) GN	(10) 1334	(10) I	(10) —	(10) Left Rear Turn Signal Lamp Control 2	(10) 10	(10) 0.75	(10) BU / WH	(10) 1334	(10) II	(10) —
(11) 11	(11) 0.5	(11) BN / GN	(11) 4246	(11) I	(11) —	(11) Identification Lamp Control	(11) 11	(11) 0.5	(11) BN / GN	(11) 4246	(11) II	(11) —
12	—	—	—	—	—	Not Occupied	12	—	—	—	—	—

X920C Rear License Plate Lamp Wiring Harness Extension Harness - Right to Tail Lamp Wiring Harness



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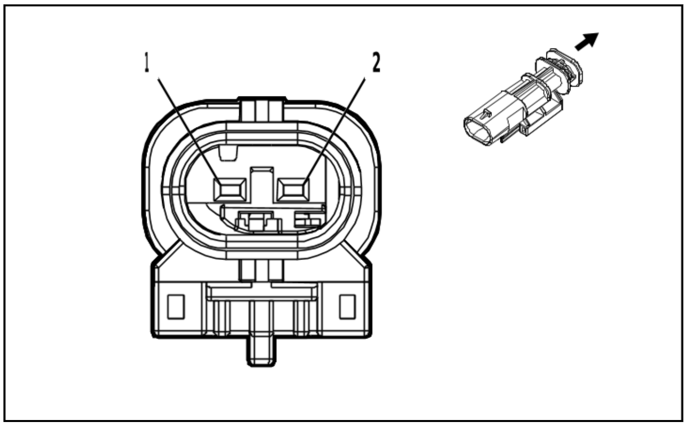

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Connector Part Information

- Harness Type: Rear License Plate Lamp Wiring Harness Extension Harness - Right
- OEM Connector: 1-2296694-1
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way F 1.2 MCON Series, Sealed(BK)

Connector Part Information

- Harness Type: Tail Lamp Wiring Harness
- OEM Connector: Not Available
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M (BK)

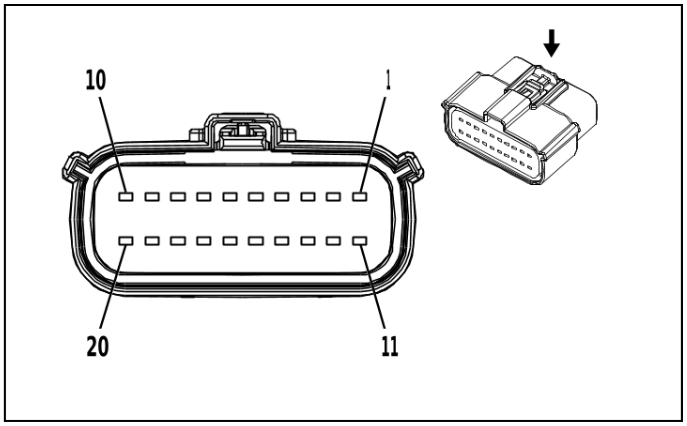
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-12 (BU)	No Tool Required
II	Not required	No Tool Required	No Tool Required

X920C Rear License Plate Lamp Wiring Harness Extension Harness - Right to Tail Lamp Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BK	(1) 1850	(1) I	(1) —	(1) Ground	(1) 1	(1) 0.5	(1) BK	(1) 1850	(1) II	(1) —
(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) I	(2) —	(2) Identification Lamp Control	(2) 2	(2) 0.5	(2) BN / GN	(2) 4246	(2) II	(2) —

X950 Rear Object Alarm Sensor Wiring Harness to Chassis Wiring Harness



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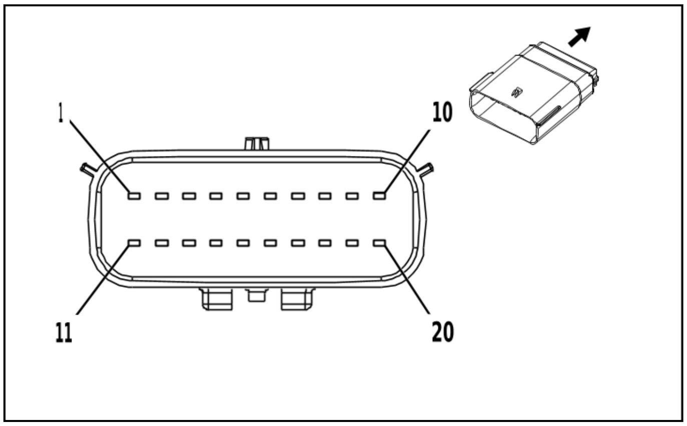

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Connector Part Information

- Harness Type: Rear Object Alarm Sensor Wiring Harness
- OEM Connector: 13504367
- Service Connector: Service by Harness - See Part Catalog
- Description: 20-Way F 1.5 MX Series, Sealed(BK)

Connector Part Information

- Harness Type: Chassis Wiring Harness
- OEM Connector: 13598210
- Service Connector: 19351705
- Description: 20-Way M 1.5 MX Series, Sealed(BK)

Terminal Part Information

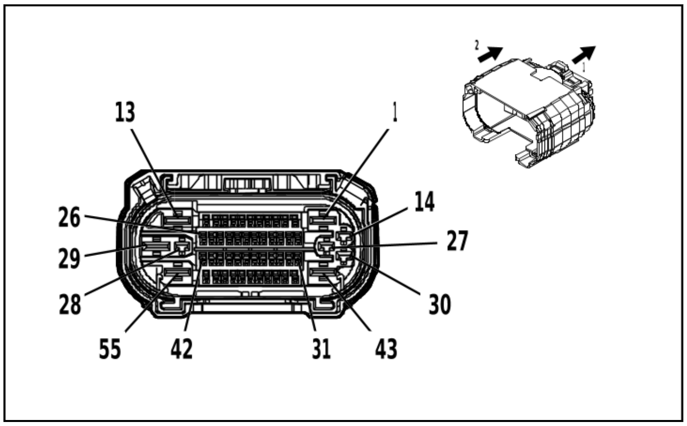
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-2A (GY)	No Tool Required
II	86800300	J-35616-3 (GY)	J-38125-217

X950 Rear Object Alarm Sensor Wiring Harness to Chassis Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) RD / GN	(1) 6940	(1) I	(1) —	(1) Battery Positive Voltage	(1) 1	(1) 0.5	(1) RD / GN	(1) 6940	(1) II	(1) —
2	—	—	—	—	—	Not Occupied	2	—	—	—	—	—
(3) 3	(3) 0.5	(3) WH	(3) 4100	(3) I	(3) —	(3) AUTOSAR CAN Bus [-] 4 Serial Data	(3) 3	(3) 0.5	(3) WH	(3) 4100	(3) II	(3) —
(4) 4	(4) 0.5	(4) BU / VT	(4) 4101	(4) I	(4) —	(4) AUTOSAR CAN Bus [+] 4 Serial Data	(4) 4	(4) 0.5	(4) BU / VT	(4) 4101	(4) II	(4) —
5 - 8	—	—	—	—	—	Not Occupied	5 - 8	—	—	—	—	—
(9) 9	(9) 0.5	(9) BN / WH	(9) 2374	(9) I	(9) —	(9) Object Sensor Voltage Reference	(9) 9	(9) 0.5	(9) BN / WH	(9) 2374	(9) II	(9) —
(10) 10	(10) 0.5	(10) YE	(10) 2375	(10) I	(10) —	(10) Left Rear Outer Parking Assist Sensor Signal	(10) 10	(10) 0.5	(10) YE	(10) 2375	(10) II	(10) —
(11) 11	(11) 0.5	(11) YE / BU	(11) 2376	(11) I	(11) —	(11) Left Rear Middle Parking Assist Sensor Signal	(11) 11	(11) 0.5	(11) YE / BU	(11) 2376	(11) II	(11) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(12) 12	(12) 0.5	(12) YE / WH	(12) 2377	(12) I	(12) —	(12) Right Rear Middle Parking Assist Sensor Signal	(12) 12	(12) 0.5	(12) YE / WH	(12) 2377	(12) II	(12) —
(13) 13	(13) 0.5	(13) YE / VT	(13) 2378	(13) I	(13) —	(13) Right Rear Outer Parking Assist Sensor Signal	(13) 13	(13) 0.5	(13) YE / VT	(13) 2378	(13) II	(13) —
(14) 14	(14) 0.5	(14) BK / GY	(14) 2379	(14) I	(14) —	(14) Object Sensor Low Reference	(14) 14	(14) 0.5	(14) BK / GY	(14) 2379	(14) II	(14) —
(15) 15	(15) 0.5	(15) GN / YE	(15) 6846	(15) I	(15) —	(15) Rear License Plate Lamp Control	(15) 15	(15) 0.5	(15) GN / YE	(15) 6846	(15) II	(15) —
(16) 16	(16) 0.75	(16) BK	(16) 1850	(16) I	(16) —	(16) Ground	(16) 16	(16) 1	(16) BK	(16) 1850	(16) II	(16) —
(17) 17	(17) 0.5	(17) BK / WH	(17) 1951	(17) I	(17) —	(17) Signal Ground	(17) 17	(17) 1	(17) BK	(17) 1850	(17) II	(17) —
18 - 20	—	—	—	—	—	Not Occupied	18 - 20	—	—	—	—	—

X950D Engine Wiring Harness to Engine Wiring Harness



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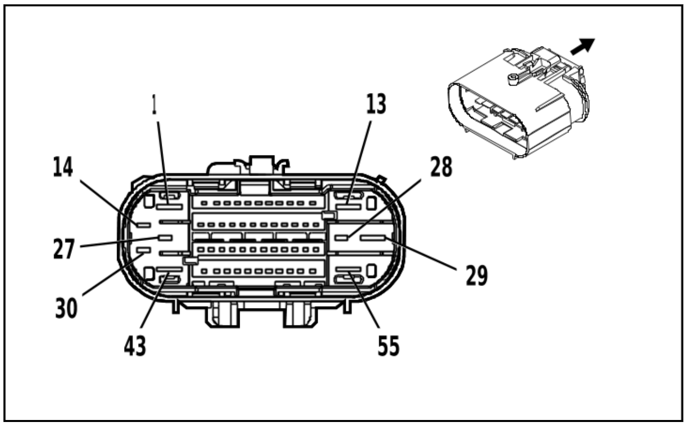


4993301

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 35253720
- Service Connector: 19371185
- Description: 55-Way F 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 35205187
- Service Connector: 84727364
- Description: 55-Way M 1.2 OCS, 2.8, 6.3 CTS Series, Sealed(BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	19332901	J-35616-35 (VT)	J-38125-212
II	19370818	J-35616-12 (BU)	J-38125-553
III	84634921	J-35616-42 (RD)	J-38125-212
IV	84847992	J-35616-32 (OG)	J-38125-36

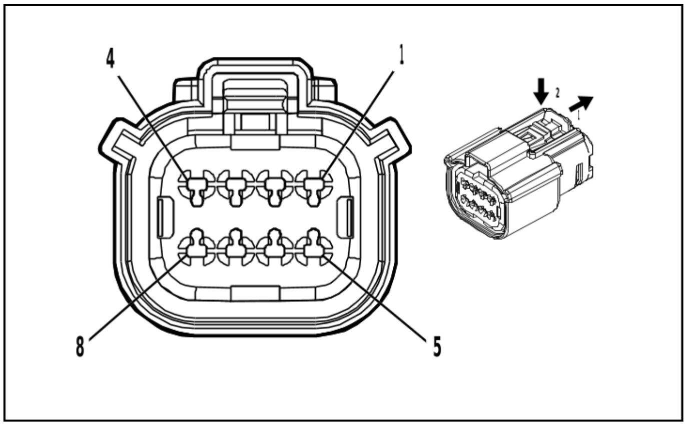
Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
V	84867140	J-35616-13 (BU)	J-38125-553
VI	84992391	J-35616-5 (PU)	J-38125-36

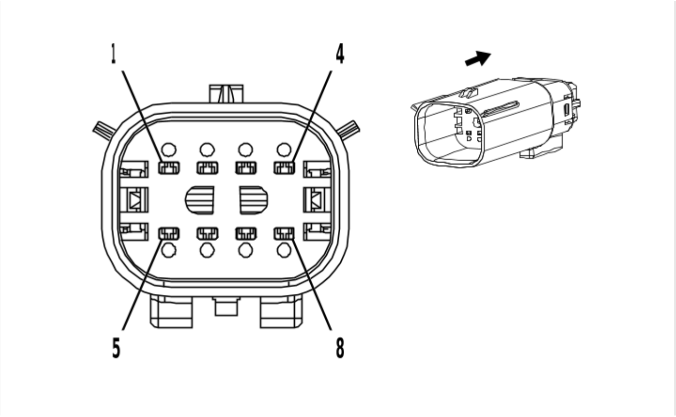
X950D Engine Wiring Harness to Engine Wiring Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 2.5	(1) GY / BU	(1) 1581	(1) III	(1) —	(1) Glow Plug 1 Control	(1) 1	(1) 2.5	(1) GY / BU	(1) 1581	(1) IV	(1) —
2 - 12	—	—	—	—	—	Not Occupied	2 - 12	—	—	—	—	—
(13) 13	(13) 2.5	(13) GY / VT	(13) 1586	(13) III	(13) —	(13) Glow Plug 6 Control	(13) 13	(13) 2.5	(13) GY / VT	(13) 1586	(13) IV	(13) —
(14) 14	(14) 2.5	(14) GY / BN	(14) 1582	(14) I	(14) —	(14) Glow Plug 2 Control	(14) 14	(14) 2.5	(14) GY / BN	(14) 1582	(14) VI	(14) —
(15) 15	(15) 0.5	(15) WH	(15) 4055	(15) II	(15) —	(15) Private Serial Data Powertrain CAN Bus [+] Serial Data	(15) 15	(15) 0.5	(15) WH	(15) 4055	(15) V	(15) —
(16) 16	(16) 0.5	(16) BU / GY	(16) 4054	(16) II	(16) —	(16) Private Serial Data Powertrain CAN Bus [-] Serial Data	(16) 16	(16) 0.5	(16) BU / GY	(16) 4054	(16) V	(16) —
(17) 17	(17) 0.5	(17) BK / WH	(17) 6151	(17) II	(17) —	(17) Engine Control Module Ground	(17) 17	(17) 0.5	(17) BK / WH	(17) 6151	(17) V	(17) —
(18) 18	(18) 0.5	(18) BK / BU	(18) 10597	(18) II	(18) —	(18) Engine Control Sensors Low Reference 3	(18) 18	(18) 0.5	(18) BK / BU	(18) 10597	(18) V	(18) —
(19) 19	(19) 0.5	(19) BN	(19) 3681	(19) II	(19) —	(19) Charge Air Cooler Outlet Temperature Sensor Signal	(19) 19	(19) 0.5	(19) BN	(19) 3681	(19) V	(19) —
(20) 20	(20) 0.75	(20) VT / GN	(20) 4320	(20) II	(20) —	(20) Powertrain Sensor Bus Enable	(20) 20	(20) 0.5	(20) VT / GN	(20) 4320	(20) V	(20) —
(21) 21	(21) 0.5	(21) WH	(21) 4055	(21) II	(21) —	(21) Private Serial Data Powertrain CAN Bus [+] Serial Data	(21) 21	(21) 0.5	(21) WH	(21) 4055	(21) V	(21) —
(22) 22	(22) 0.5	(22) BU / GY	(22) 4054	(22) II	(22) —	(22) Private Serial Data Powertrain CAN Bus [-] Serial Data	(22) 22	(22) 0.5	(22) BU / GY	(22) 4054	(22) V	(22) —
23 - 26	—	—	—	—	—	Not Occupied	23 - 26	—	—	—	—	—
(27) 27	(27) 2.5	(27) GY / GN	(27) 1583	(27) I	(27) —	(27) Glow Plug 3 Control	(27) 27	(27) 2.5	(27) GY / GN	(27) 1583	(27) VI	(27) —

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(28) 28	(28) 2.5	(28) WH / BK	(28) 1587	(28) I	(28) —	(28) Glow Plug 7 Control	(28) 28	(28) 2.5	(28) WH / BK	(28) 1587	(28) VI	(28) —
29	—	—	—	—	—	Not Occupied	29	—	—	—	—	—
(30) 30	(30) 2.5	(30) GY / YE	(30) 1584	(30) I	(30) —	(30) Glow Plug 4 Control	(30) 30	(30) 2.5	(30) GY / YE	(30) 1584	(30) VI	(30) —
31 - 42	—	—	—	—	—	Not Occupied	31 - 42	—	—	—	—	—
(43) 43	(43) 2.5	(43) GY / WH	(43) 1585	(43) III	(43) —	(43) Glow Plug 5 Control	(43) 43	(43) 2.5	(43) GY / WH	(43) 1585	(43) IV	(43) —
44 - 54	—	—	—	—	—	Not Occupied	44 - 54	—	—	—	—	—
(55) 55	(55) 2.5	(55) WH / BU	(55) 1588	(55) III	(55) —	(55) Glow Plug 8 Control	(55) 55	(55) 2.5	(55) WH / BU	(55) 1588	(55) IV	(55) —

X960A Engine Wiring Harness to Engine Wiring Jumper Harness





Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13520069
- Service Connector: 84928314
- Description: 8-Way F 1.5 MX Series, Sealed(BK)

Connector Part Information
- Harness Type: Engine Wiring Jumper Harness
- OEM Connector: 13520577
- Service Connector: Service by Harness - See Part Catalog
- Description: 8-Way M 1.5 MX Series, Sealed(BK)

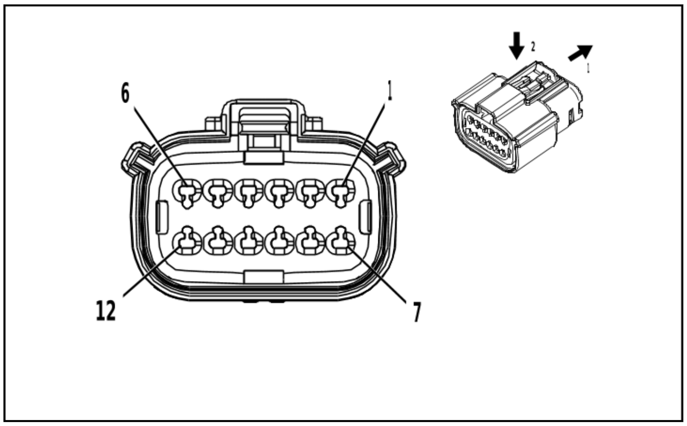
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-3 (GY)	No Tool Required

X960A Engine Wiring Harness to Engine Wiring Jumper Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) VT / BU	(1) 6270	(1) I	(1) —	(1) Crankshaft Position Sensor Voltage	(1) 1	(1) 0.5	(1) VT / BU	(1) 6270	(1) II	(1) —
(2) 2	(2) 0.5	(2) BK / VT	(2) 6272	(2) I	(2) —	(2) Crankshaft Position Sensor Low Reference	(2) 2	(2) 0.5	(2) BK / VT	(2) 6272	(2) II	(2) —
(3) 3	(3) 0.5	(3) GN	(3) 6271	(3) I	(3) —	(3) Crankshaft Position Sensor Signal	(3) 3	(3) 0.5	(3) GN	(3) 6271	(3) II	(3) —
(4) 4	(4) 0.5	(4) BN / RD	(4) 2917	(4) I	(4) —	(4) Fuel Rail Pressure Sensor 5V Reference	(4) 4	(4) 0.5	(4) BN / RD	(4) 2917	(4) II	(4) —
(5) 5	(5) 0.5	(5) BK / GN	(5) 2919	(5) I	(5) —	(5) Fuel Rail Pressure Sensor Low Reference	(5) 5	(5) 0.5	(5) BK / GN	(5) 2919	(5) II	(5) —
(6) 6	(6) 0.5	(6) BU / WH	(6) 2918	(6) I	(6) —	(6) Fuel Rail Pressure Sensor Signal	(6) 6	(6) 0.5	(6) BU / WH	(6) 2918	(6) II	(6) —
(7) 7	(7) 0.5	(7) BN / YE	(7) 2161	(7) I	(7) —	(7) Fuel Rail Pressure Sensor 2 Signal	(7) 7	(7) 0.5	(7) BN / YE	(7) 2161	(7) II	(7) —
8	—	—	—	—	—	Not Occupied	8	—	—	—	—	—

X960B Engine Wiring Harness to Engine Wiring Jumper Harness



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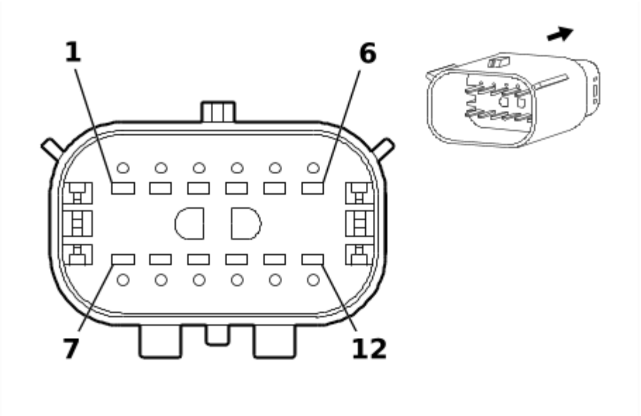


1825167

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13503526
- Service Connector: 19352907
- Description: 12-Way F 1.5 MX Series, Sealed(BK)

Connector Part Information
- Harness Type: Engine Wiring Jumper Harness
- OEM Connector: 13520579
- Service Connector: Service by Harness - See Part Catalog
- Description: 12-Way M 1.5 MX Series, Sealed(BK)

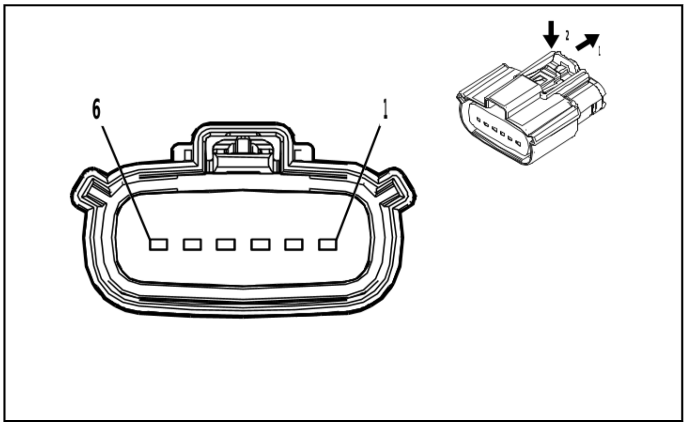
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	85528055	J-35616-2A (GY)	J-38125-217
II	Not required	J-35616-3 (GY)	No Tool Required

X960B Engine Wiring Harness to Engine Wiring Jumper Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU / RD	(1) 460	(1) I	(1) —	(1) Engine Control Sensors 5 Volt Reference 1	(1) 1	(1) 0.5	(1) BU / RD	(1) 460	(1) II	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) I	(2) —	(2) Engine Control Sensors Low Reference 1	(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) II	(2) —
(3) 3	(3) 0.5	(3) YE / BN	(3) 331	(3) I	(3) —	(3) Oil Pressure Sensor Signal	(3) 3	(3) 0.5	(3) YE / BN	(3) 331	(3) II	(3) —
(4) 4	(4) 0.5	(4) BU	(4) 410	(4) I	(4) —	(4) Engine Coolant Temperature Sensor Signal	(4) 4	(4) 0.5	(4) BU	(4) 410	(4) II	(4) —
(5) 5	(5) 0.5	(5) BK / YE	(5) 548	(5) I	(5) —	(5) Engine Control Sensors Low Reference 1	(5) 5	(5) 0.5	(5) BK / YE	(5) 548	(5) II	(5) —
(6) 6	(6) 0.5	(6) BK / WH	(6) 6151	(6) I	(6) —	(6) Engine Control Module Ground	(6) 6	(6) 0.5	(6) BK / WH	(6) 6151	(6) II	(6) —
(7) 7	(7) 0.5	(7) BN / GN	(7) 1174	(7) I	(7) —	(7) Oil Level Switch Signal	(7) 7	(7) 0.5	(7) BN / GN	(7) 1174	(7) II	(7) —
8 - 9	—	—	—	—	—	Not Occupied	8 - 9	—	—	—	—	—
(10) 10	(10) 0.5	(10) YE	(10) 2928	(10) I	(10) —	(10) Fuel Metering Solenoid Valve High Control	(10) 10	(10) 0.5	(10) YE	(10) 2928	(10) II	(10) —
(11) 11	(11) 0.5	(11) BN / BK	(11) 2929	(11) I	(11) —	(11) Fuel Metering Solenoid Valve Low Control	(11) 11	(11) 0.5	(11) BN / BK	(11) 2929	(11) II	(11) —
12	—	—	—	—	—	Not Occupied	12	—	—	—	—	—

X962 Engine Wiring Harness to Engine Coolant Temperature Sensor Harness



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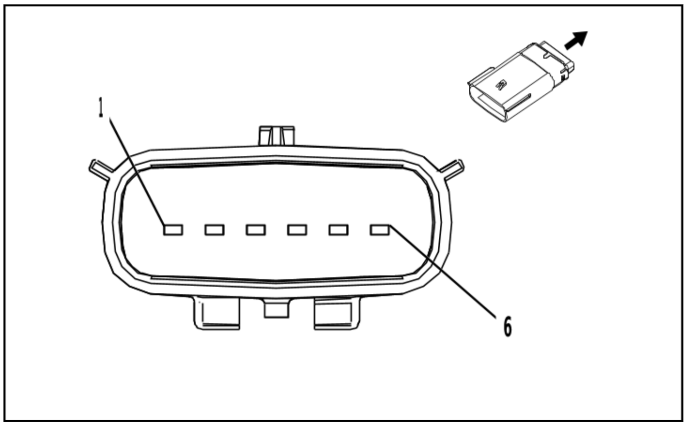


3277908

Connector Part Information
- Harness Type: Engine Wiring Harness
- OEM Connector: 13544241
- Service Connector: 86801953
- Description: 6-Way F 1.5 Series, Sealed(BK)

Connector Part Information
- Harness Type: Engine Coolant Temperature Sensor Harness
- OEM Connector: 13526225
- Service Connector: Service by Harness - See Part Catalog
- Description: 6-Way M 1.5 MX Series, Sealed(BK)

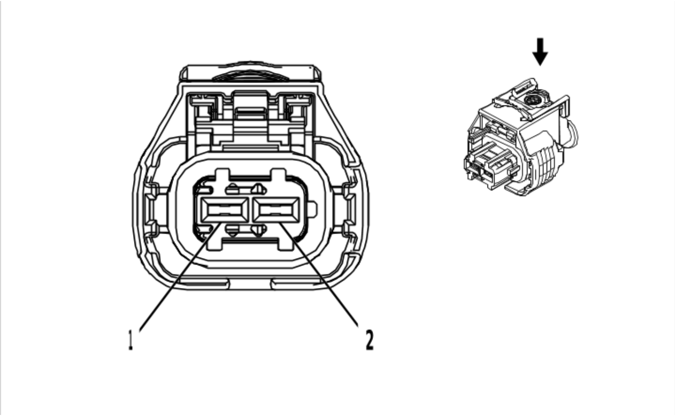
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-14 (GN)	No Tool Required
II	Not required	J-35616-3 (GY)	No Tool Required

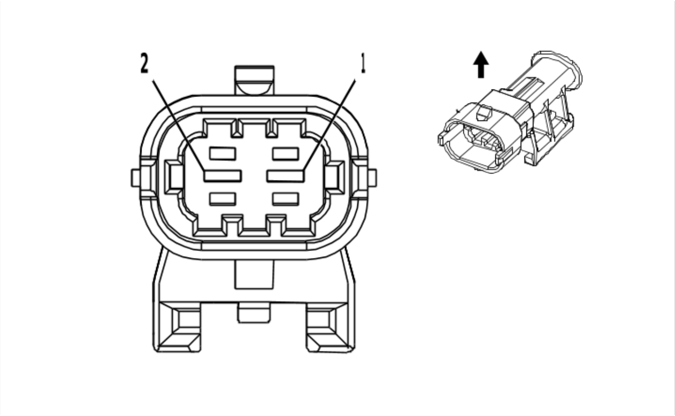
X962 Engine Wiring Harness to Engine Coolant Temperature Sensor Harness

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU	(1) 410	(1) I	(1) —	(1) Engine Coolant Temperature Sensor Signal	(1) 1	(1) 0.5	(1) BU	(1) 410	(1) II	(1) —
(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) I	(2) —	(2) Engine Control Sensors Low Reference 1	(2) 2	(2) 0.5	(2) BK / YE	(2) 548	(2) II	(2) —
(3) 3	(3) 0.5	(3) YE / BN	(3) 331	(3) I	(3) —	(3) Oil Pressure Sensor Signal	(3) 3	(3) 0.5	(3) YE / BN	(3) 331	(3) II	(3) —
(4) 4	(4) 0.5	(4) BK / YE	(4) 548	(4) I	(4) —	(4) Engine Control Sensors Low Reference 1	(4) 4	(4) 0.5	(4) BK / YE	(4) 548	(4) II	(4) —
(5) 5	(5) 0.5	(5) WH / RD	(5) 480	(5) I	(5) —	(5) Engine Control Vehicle Sensors 5 Volt Reference 1	(5) 5	(5) 0.5	(5) WH / RD	(5) 480	(5) II	(5) —
6	—	—	—	—	—	Not Occupied	6	—	—	—	—	—

X977 Engine Wiring Harness to Accessory Wiring Harness (VYU)



2577394



2667643

Connector Part Information

- Harness Type: Engine Wiring Harness
- OEM Connector: 1 928 405 714
- Service Connector: 13384371
- Description: 2-Way F 2.8 Series, Sealed(BK)

Connector Part Information

- Harness Type: Accessory Wiring Harness
- OEM Connector: 1 928 404 226
- Service Connector: Service by Harness - See Part Catalog
- Description: 2-Way M 2.8 Timer Series, Sealed(BK)

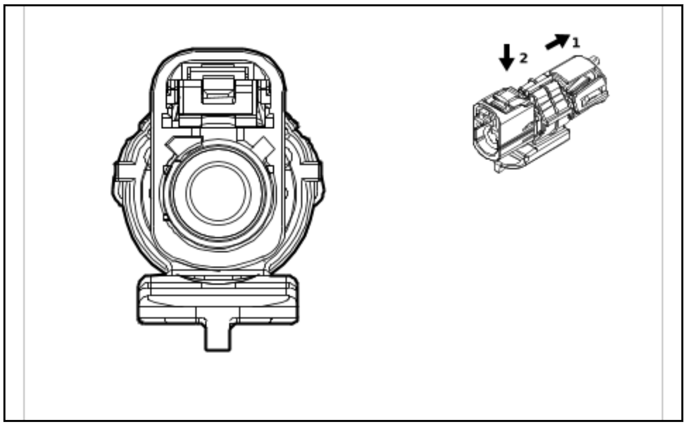
Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	J-35616-35 (VT)	No Tool Required
II	Not required	J-35616-5 (PU)	No Tool Required

X977 Engine Wiring Harness to Accessory Wiring Harness (VYU)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BN	(1) 25	(1) I	(1) —	(1) Charge Indicator Control	(1) 1	(1) 0.5	(1) BN	(1) 25	(1) II	(1) —
(2) 2	(2) 0.5	(2) GY	(2) 23	(2) I	(2) —	(2) Generator Field Duty Cycle Signal	(2) 2	(2) 0.5	(2) GY	(2) 23	(2) II	(2) —

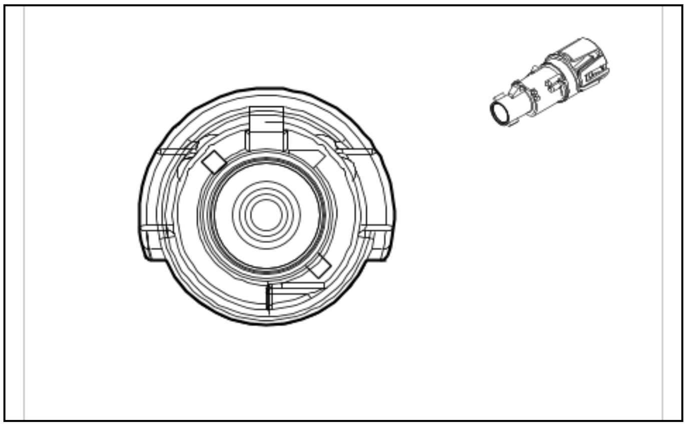
X985 Rearview Driver Information Camera Rear Closure Coaxial Cable to Inside Rearview Mirror Wiring Harness (DRZ)



5519150

Connector Part Information

- Harness Type: Rearview Driver Information Camera Rear Closure Coaxial Cable COAX
- OEM Connector: Not Available
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way F



5633901

Connector Part Information

- Harness Type: Inside Rearview Mirror Wiring Harness COAX
- OEM Connector: 33355540
- Service Connector: Service by Cable Assembly — See Part Catalog
- Description: 1-Way M Coax Type, Sealed(BU)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool
I	Not required	No Tool Required	No Tool Required

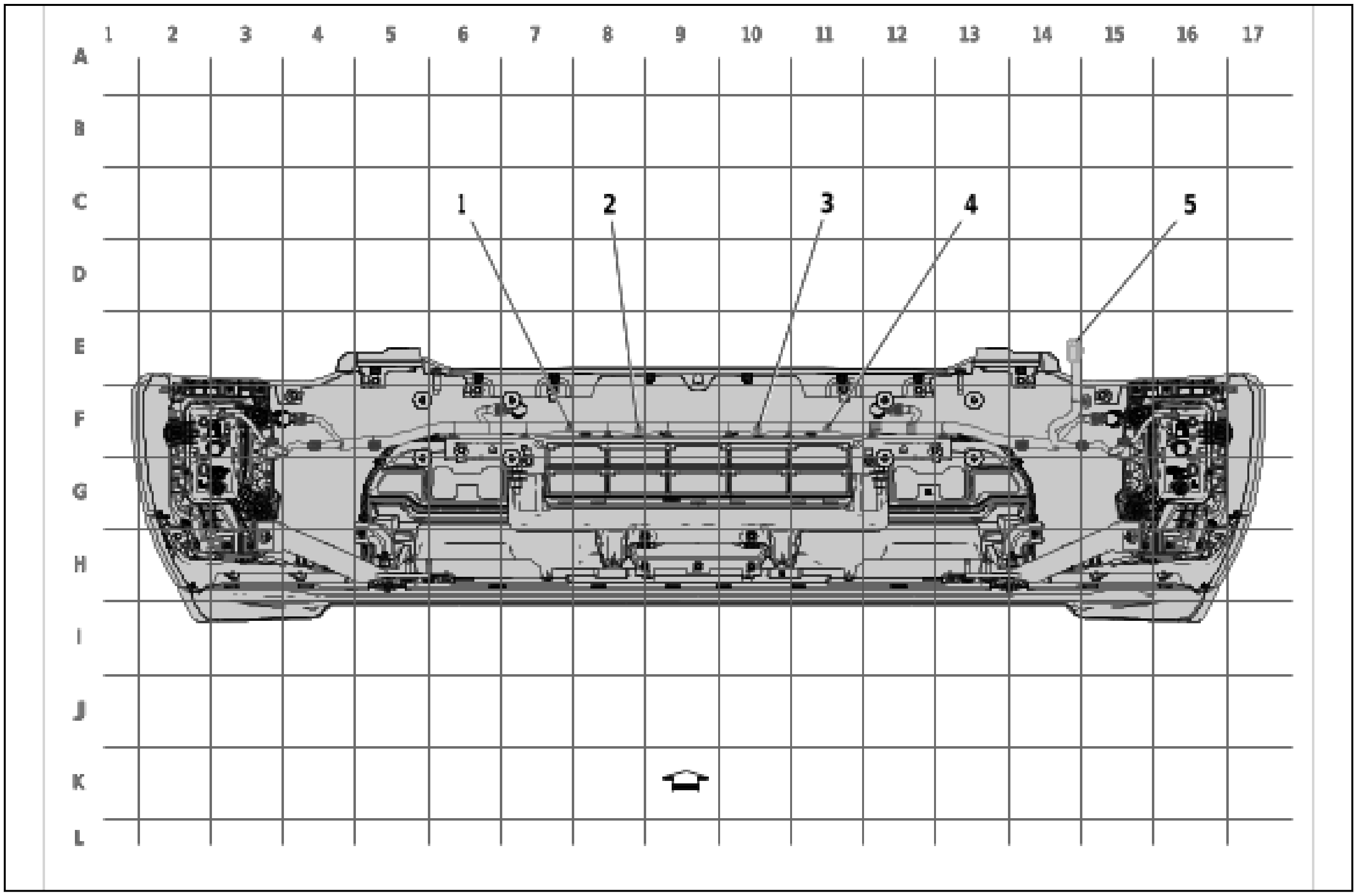
X985 Rearview Driver Information Camera Rear Closure Coaxial Cable to Inside Rearview Mirror Wiring Harness (DRZ)

Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
—	—	Coax Cable	—	I	—	Full Display Mirror Rear Camera Coaxial Video Signal	—	—	Coax Cable	—	I	—

Electrical Component Locator and Harness Routing Views

Schematic and Routing Diagrams

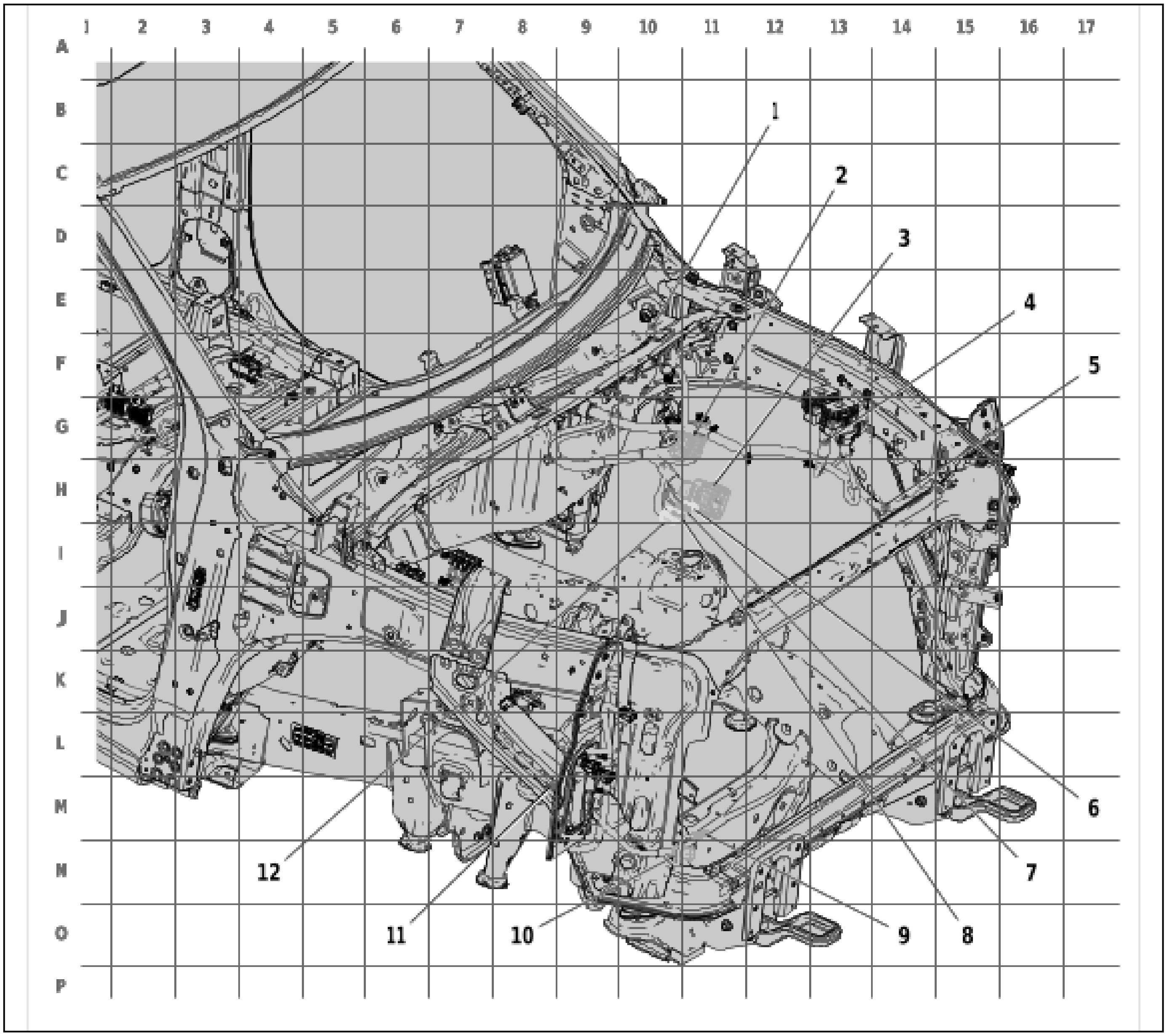
Front of Vehicle - Front Object Alarm Sensor Wiring Harness



6215706

Items
(1) J132 Front Object Alarm Sensor Wiring Harness
(2) J127 Front Object Alarm Sensor Wiring Harness
(3) J129 Front Object Alarm Sensor Wiring Harness
(4) J126 Front Object Alarm Sensor Wiring Harness
(5) X150 Front Object Alarm Sensor Wiring Harness to Body Wiring Harness (UKL)

Engine Compartment - Body Wiring Harness - Front

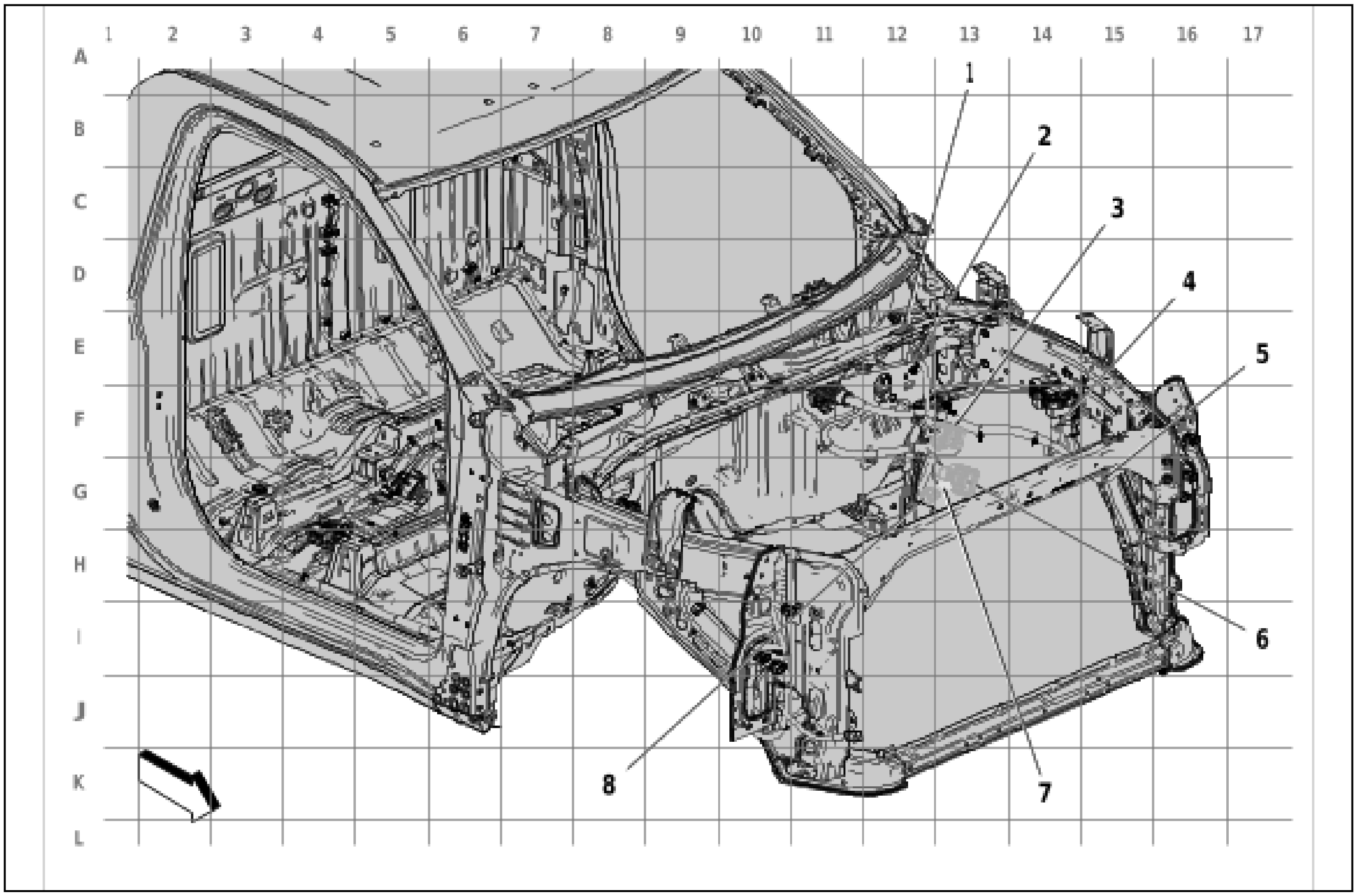


6215710

Items
(1) J326 Body Wiring Harness
(2) X125 Body Wiring Harness to Engine Wiring Harness
(3) X410 Body Wiring Harness to Chassis Wiring Harness
(4) J301 Body Wiring Harness
(5) J300 Body Wiring Harness
(6) X402C Body Wiring Harness to Chassis Wiring Harness
(7) X402A Body Wiring Harness to Chassis Wiring Harness (UV2)
(8) X402B Body Wiring Harness to Chassis Wiring Harness (UV2)
(9) X122 Front View Camera Switch Wiring Harness to Body Wiring Harness (UV2)
(10) X150 Front Object Alarm Sensor Wiring Harness to Body Wiring Harness (UKL)

Items
(11) J318 Body Wiring Harness
(12) X424 Body Wiring Harness to Chassis Wiring Harness (FHS)

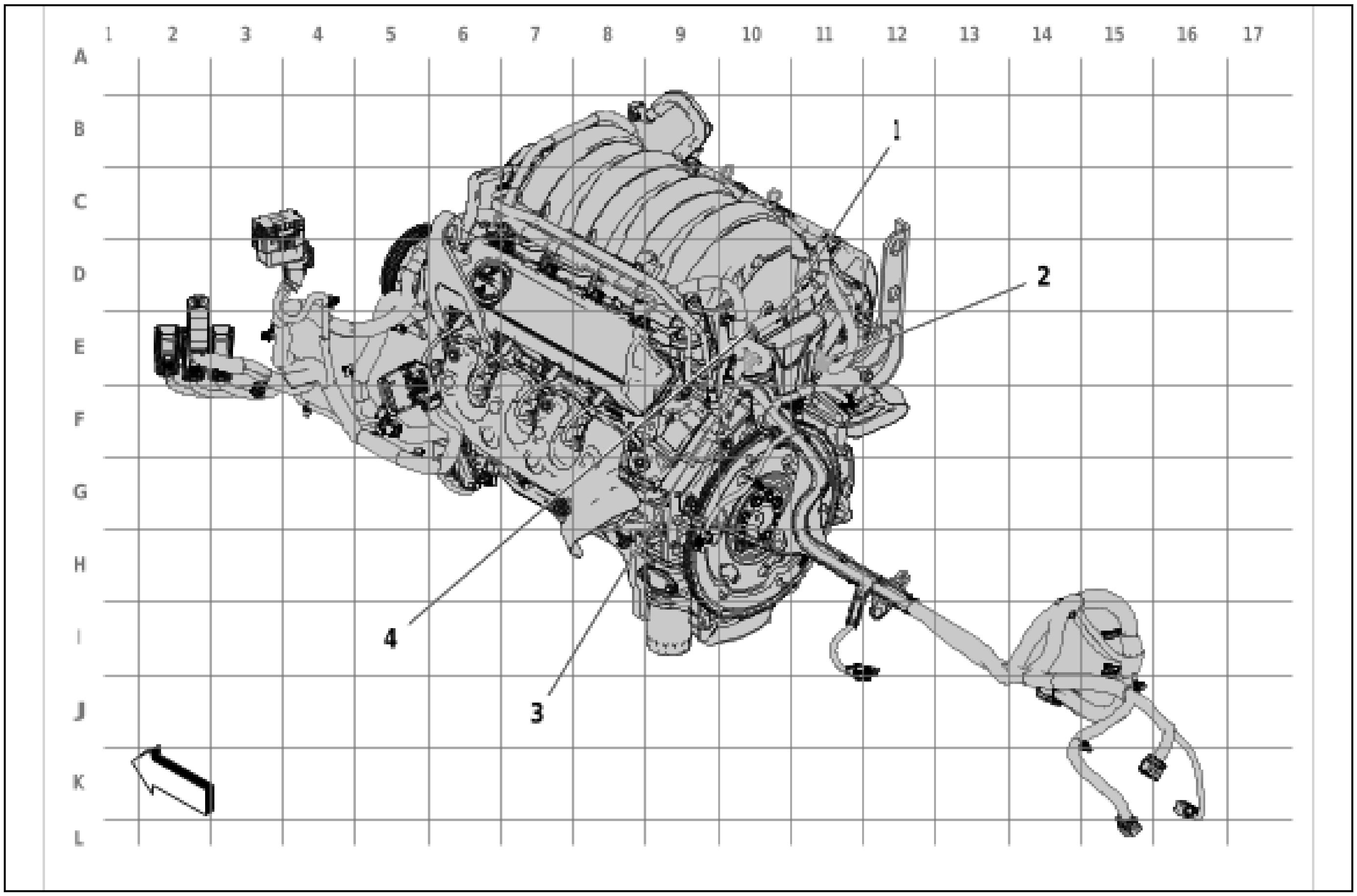
Engine Compartment - Body Wiring Harness - Left



6215711

Items
(1) J326 Body Wiring Harness
(2) J308 Body Wiring Harness
(3) X125 Body Wiring Harness to Engine Wiring Harness
(4) J301 Body Wiring Harness
(5) J300 Body Wiring Harness
(6) X410 Body Wiring Harness to Chassis Wiring Harness
(7) X402C Body Wiring Harness to Chassis Wiring Harness
(8) X424 Body Wiring Harness to Chassis Wiring Harness (FHS)

Engine Compartment - Engine Wiring Harness - Left Rear (L8T)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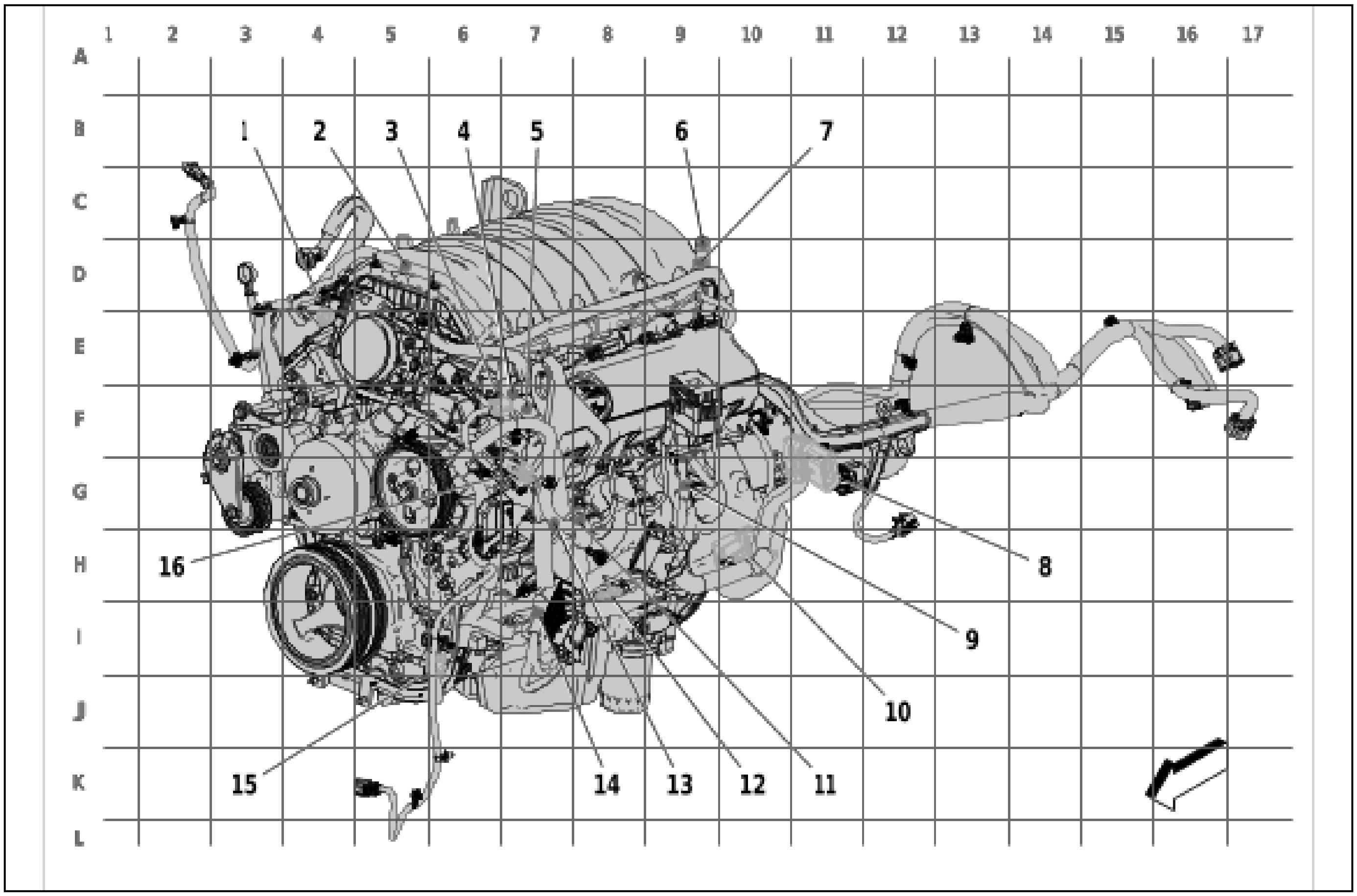
6215712

Items
(1) J107 Engine Wiring Harness (L8T)
(2) X161 Engine Wiring Harness to Fuel Injector Wiring Harness - Right (L8T)
(3) X160 Engine Wiring Harness to Fuel Injector Wiring Harness - Left (L8T)
(4) J106 Engine Wiring Harness (L8T)

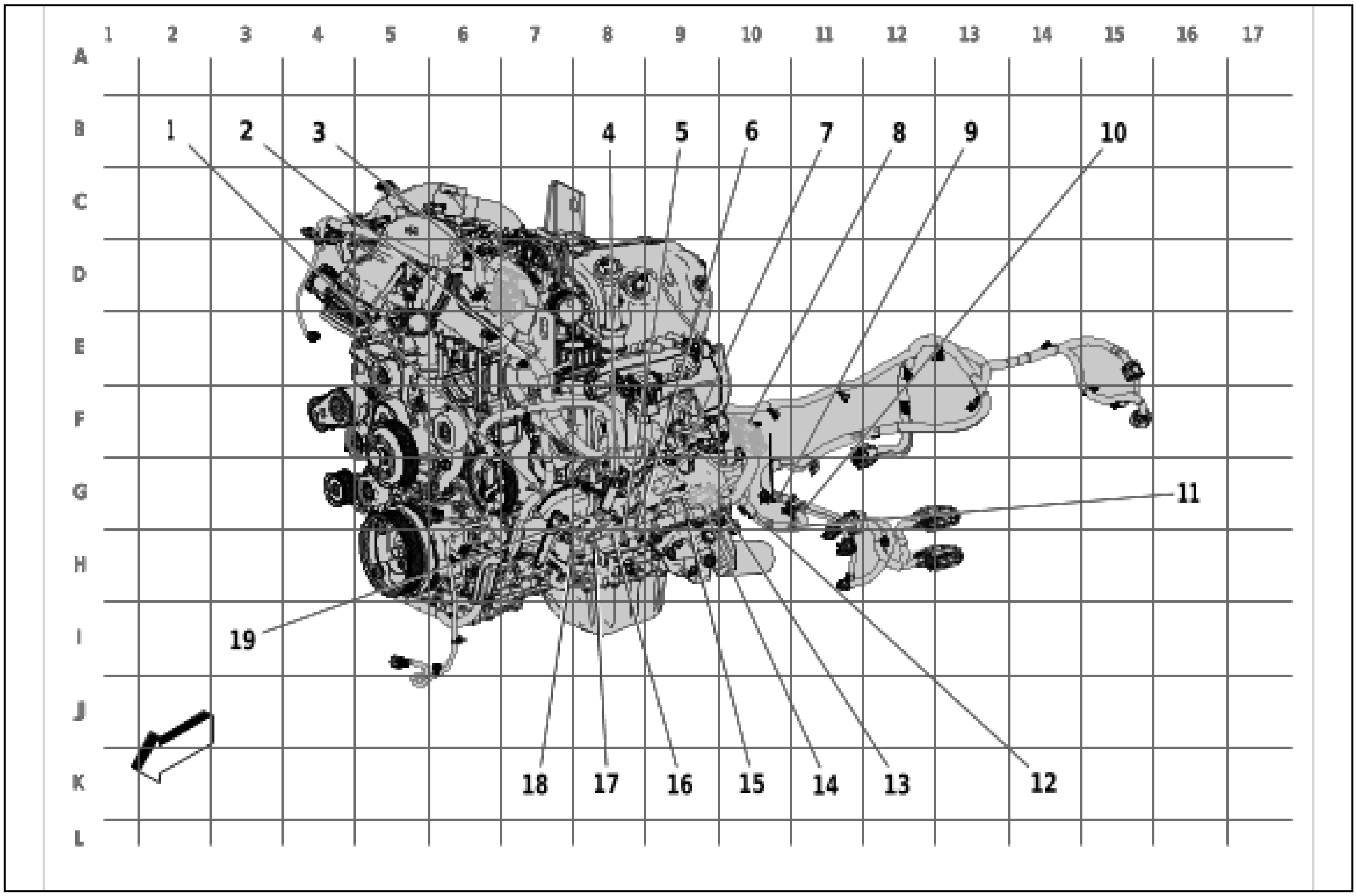
Engine Compartment - Engine Wiring Harness - Left Front (L8T)



6215713

Items
(1) X977 Engine Wiring Harness to Accessory Wiring Harness (VYU)
(2) J105 Engine Wiring Harness (L8T)
(3) X135 Engine Wiring Harness to Battery Positive Cable
(4) J104 Engine Wiring Harness (L8T)
(5) J103 Engine Wiring Harness (L8T)
(6) J109 Engine Wiring Harness (L8T)
(7) J108 Engine Wiring Harness (L8T)
(8) X125 Body Wiring Harness to Engine Wiring Harness
(9) J112 Engine Wiring Harness
(10) X401 Chassis Wiring Harness to Engine Wiring Harness (L5P)
(11) J100 Engine Wiring Harness (L8T)
(12) X415 Engine Wiring Harness to Transfer Case Selector Shift Control Switch Wiring Harness Extension Harness (NQF / NQH)
(13) J101 Engine Wiring Harness (L8T)
(14) J111 Engine Wiring Harness
(15) X128 Engine Wiring Harness to Camshaft Position Sensor Wiring harness (L8T)
(16) X962 Engine Wiring Harness to Engine Coolant Temperature Sensor Harness (L8T)

Engine Compartment - Engine Wiring Harness - Left Front (L5P)

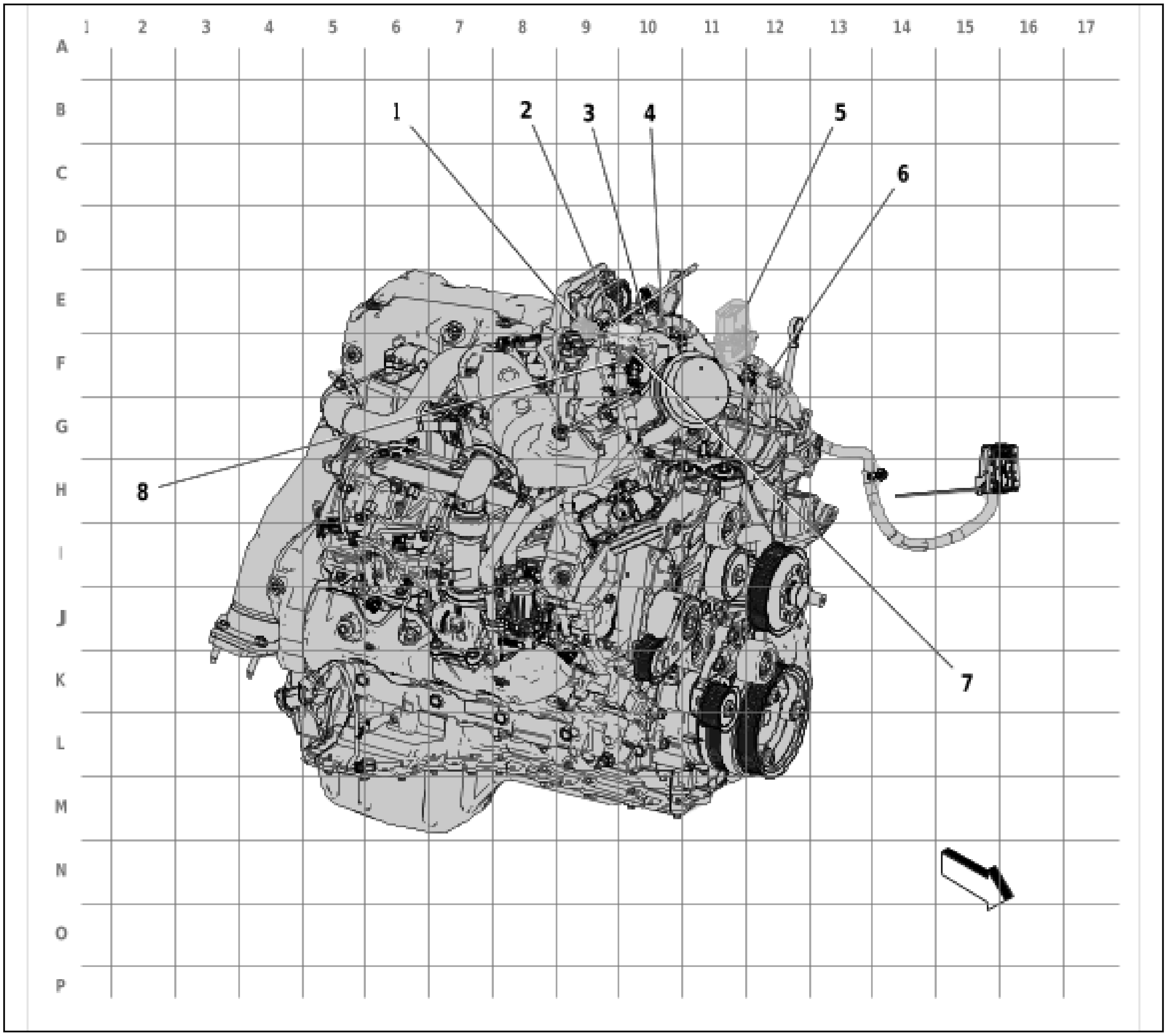


6215718

Items
(1) J110 Engine Wiring Harness
(2) J105 Engine Wiring Harness (L8T)
(3) X950D Engine Wiring Harness Chassis to Engine Wiring Harness
(4) J123 Engine Wiring Harness (L5P)
(5) J122 Engine Wiring Harness (L5P)
(6) J121 Engine Wiring Harness (L5P)
(7) J120 Engine Wiring Harness (L5P)
(8) X125 Body Wiring Harness to Engine Wiring Harness
(9) J124 Engine Wiring Harness (L5P)
(10) J117 PTO Wiring Harness
(11) J118 Engine Wiring Harness (L5P)
(12) J119 Engine Wiring Harness Chassis (PTO)
(13) J101 Engine Wiring Harness (L8T)
(14) X401 Chassis Wiring Harness to Engine Wiring Harness (L5P)
(15) J112 Engine Wiring Harness
(16) X415 Engine Wiring Harness to Transfer Case Selector Shift Control Switch Wiring Harness Extension Harness (NQF / NQH)
(17) J100 Engine Wiring Harness (L8T)

Items
(18) J108 Engine Wiring Harness (L8T)
(19) J102 Engine Wiring Harness (L8T)

Engine Compartment - Engine Wiring Harness - Right Front (L5P)

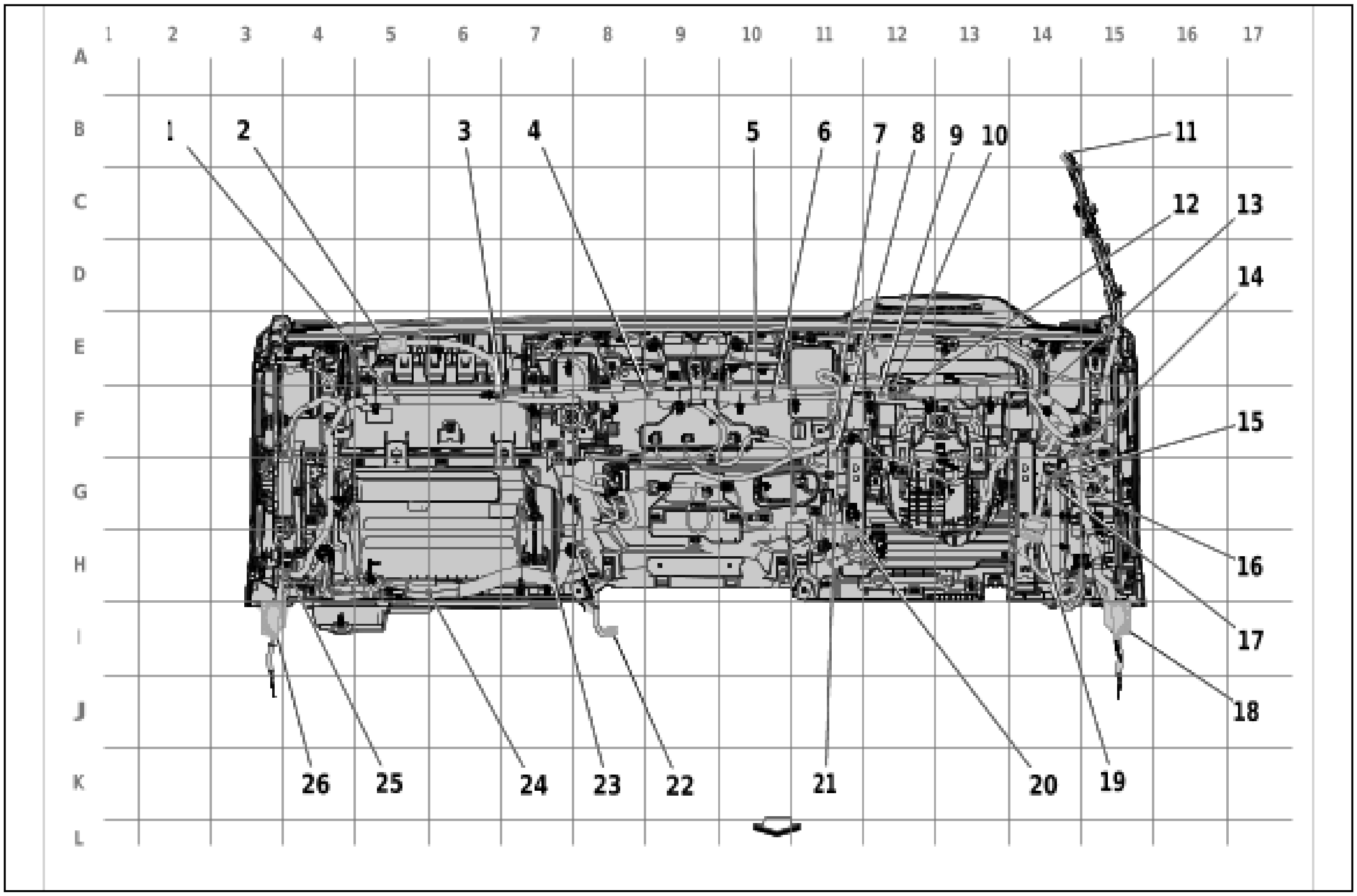


6215719

Items
(1) X960A Engine Wiring Harness to Engine Wiring Harness Extension (L5P)
(2) X960B Engine Wiring Harness to Engine Wiring Harness Extension (L5P)
(3) J114 Engine Wiring Harness (L5P)
(4) J111 Engine Wiring Harness
(5) X950D Engine Wiring Harness Chassis to Engine Wiring Harness
(6) J113 Engine Wiring Harness (L5P)

Items
(7) J115 Engine Wiring Harness (L5P)
(8) J116 Engine Wiring Harness (L5P)

Instrument Panel Wiring Harness

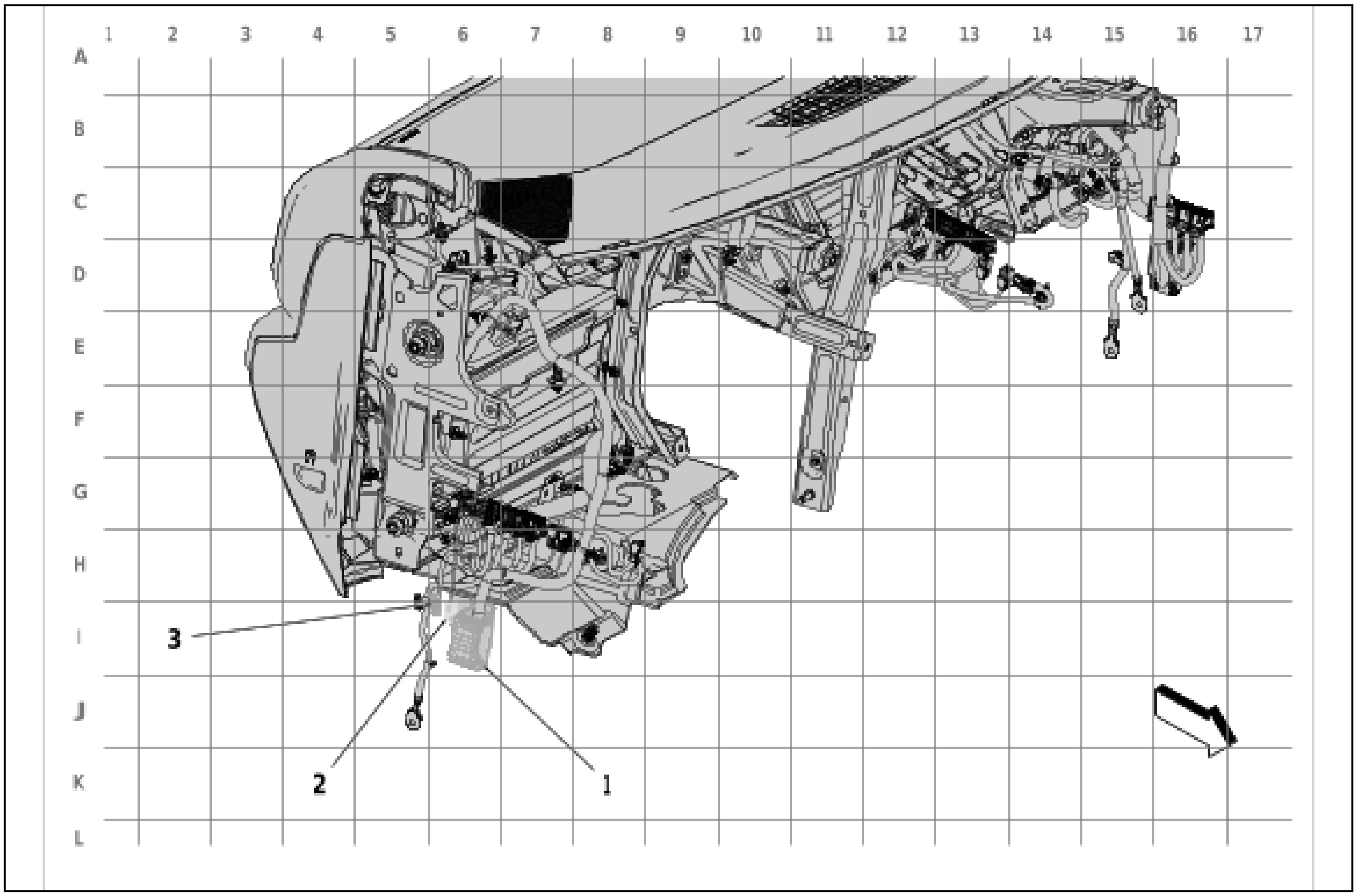


6215721

Items
(1) J213 Instrument Panel Wiring Harness
(2) X370A Dome Lamp Wiring Harness to Instrument Panel Wiring Harness (-GD2 / GD3 / GD5)
(3) J212 Instrument Panel Wiring Harness
(4) J211 Instrument Panel Wiring Harness
(5) J210 Instrument Panel Wiring Harness
(6) J209 Instrument Panel Wiring Harness
(7) J208 Instrument Panel Wiring Harness
(8) J209 Instrument Panel Wiring Harness
(9) J206 Instrument Panel Wiring Harness
(10) J207 Instrument Panel Wiring Harness
(11) X850 Roof Wiring Harness to Instrument Panel Wiring Harness
(12) J205 Instrument Panel Wiring Harness
(13) J205 Instrument Panel Wiring Harness
(14) J204 Instrument Panel Wiring Harness
(15) J201 Instrument Panel Wiring Harness

Items
(16) J200 Instrument Panel Wiring Harness
(17) J202 Instrument Panel Wiring Harness
(18) X210 Instrument Panel Wiring Harness to Body Wiring Harness
(19) X213 Auxiliary Fuse Block Wiring Harness to Instrument Panel Wiring Harness
(20) X250 Instrument Panel Wiring Harness to Heater Wiring Harness
(21) J209 Instrument Panel Wiring Harness
(22) X226 Front Floor Console Wiring Harness to Instrument Panel Wiring Harness (D07)
(23) J210 Instrument Panel Wiring Harness
(24) J207 Instrument Panel Wiring Harness
(25) J215 Instrument Panel Wiring Harness
(26) X211 Instrument Panel Wiring Harness to Body Wiring Harness

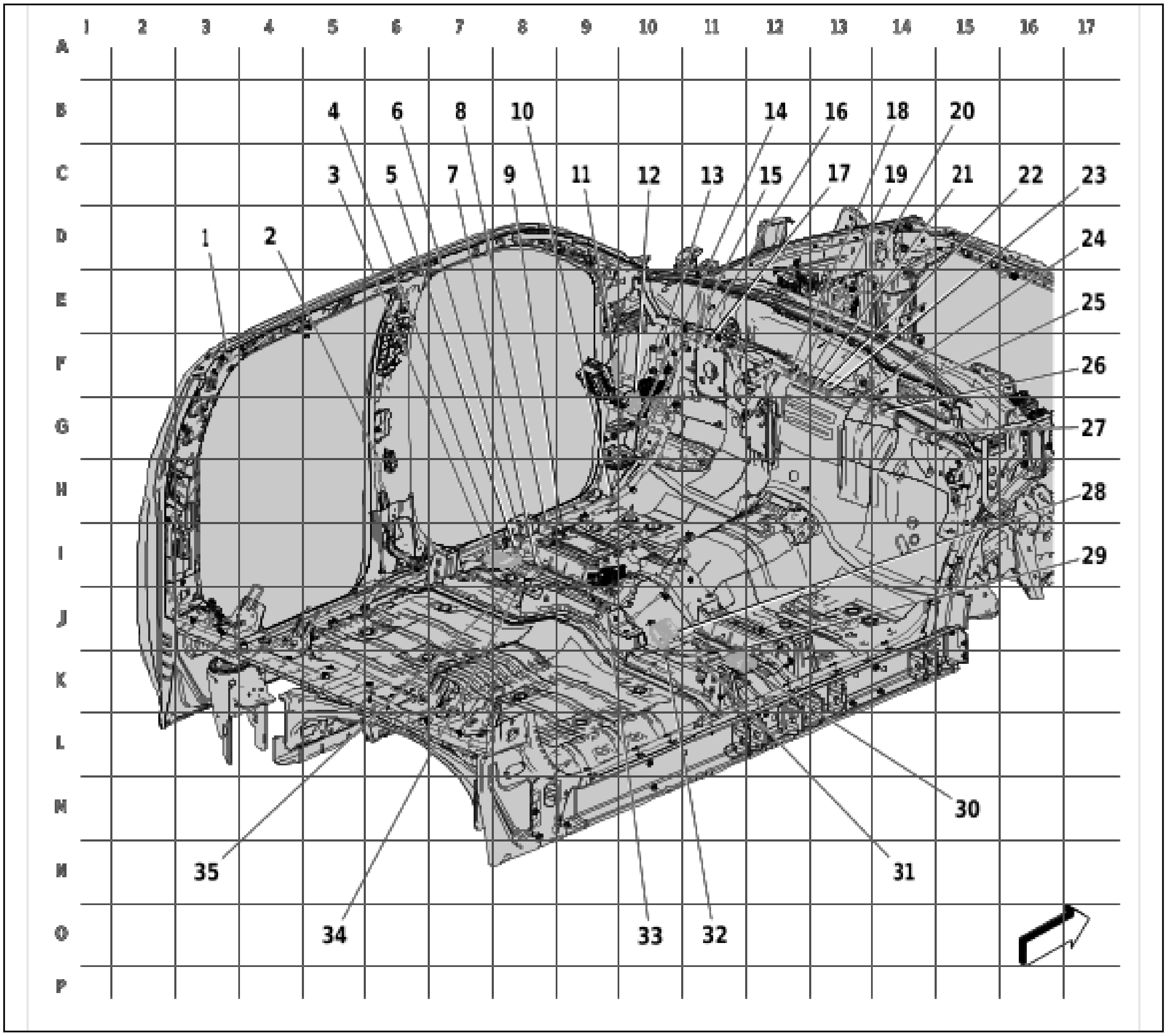
Instrument Panel Wiring Harness - Right



6215722

Items
(1) X211 Instrument Panel Wiring Harness to Body Wiring Harness
(2) X217 Body Wiring Harness to Instrument Panel Wiring Harness
(3) X218 Instrument Panel Wiring Harness to Body Wiring Harness

Passenger Compartment - Body Wiring Harness - Left Front - Double Cab/Crew Cab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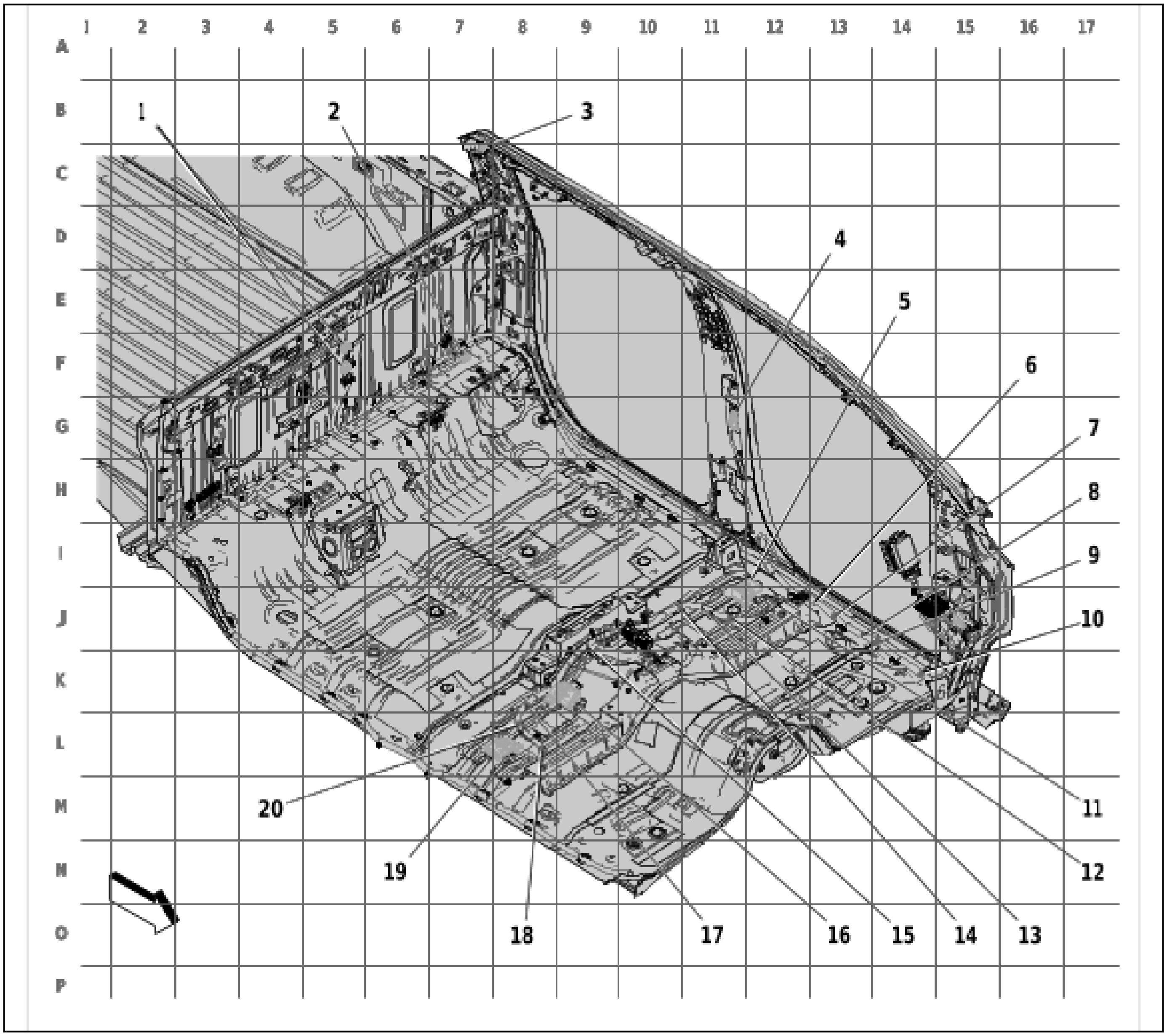
6215726

Items
(1) X309A Body Wiring Harness to Inside Rearview Mirror Wiring Harness
(2) X700 Rear Side Door Door Wiring Harness - Left to Body Wiring Harness (Double Cab / Crew Cab)
(3) X331 Front Seat Wiring Harness - Driver to Body Wiring Harness
(4) J336 Body Wiring Harness

Items
(5) J330 Body Wiring Harness
(6) J327 Body Wiring Harness
(7) J331 Body Wiring Harness
(8) J312 Body Wiring Harness
(9) J311 Body Wiring Harness
(10) J310 Body Wiring Harness
(11) X500 Front Side Door Door Wiring Harness - Left to Body Wiring Harness
(12) X210 Instrument Panel Wiring Harness to Body Wiring Harness
(13) J308 Body Wiring Harness
(14) J328 Body Wiring Harness
(15) J309 Body Wiring Harness
(16) J303 Body Wiring Harness
(17) J302 Body Wiring Harness
(18) J307 Body Wiring Harness
(19) J306 Body Wiring Harness
(20) J305 Body Wiring Harness
(21) J304 Body Wiring Harness
(22) J329 Body Wiring Harness
(23) J322 Body Wiring Harness
(24) J321 Body Wiring Harness
(25) J385 Body Wiring Harness
(26) J320 Body Wiring Harness
(27) J319 Body Wiring Harness
(28) X227 Front Floor Console Wiring Harness to Body Wiring Harness
(29) J334 Body Wiring Harness
(30) X336 Front Seat Wiring Harness - Passenger to Body Wiring Harness
(31) J325 Body Wiring Harness
(32) J333 Body Wiring Harness
(33) J313 Body Wiring Harness
(34) J314 Body Wiring Harness
(35) J315 Body Wiring Harness

Passenger Compartment - Body Wiring Harness - Middle - Double Cab/Crew Cab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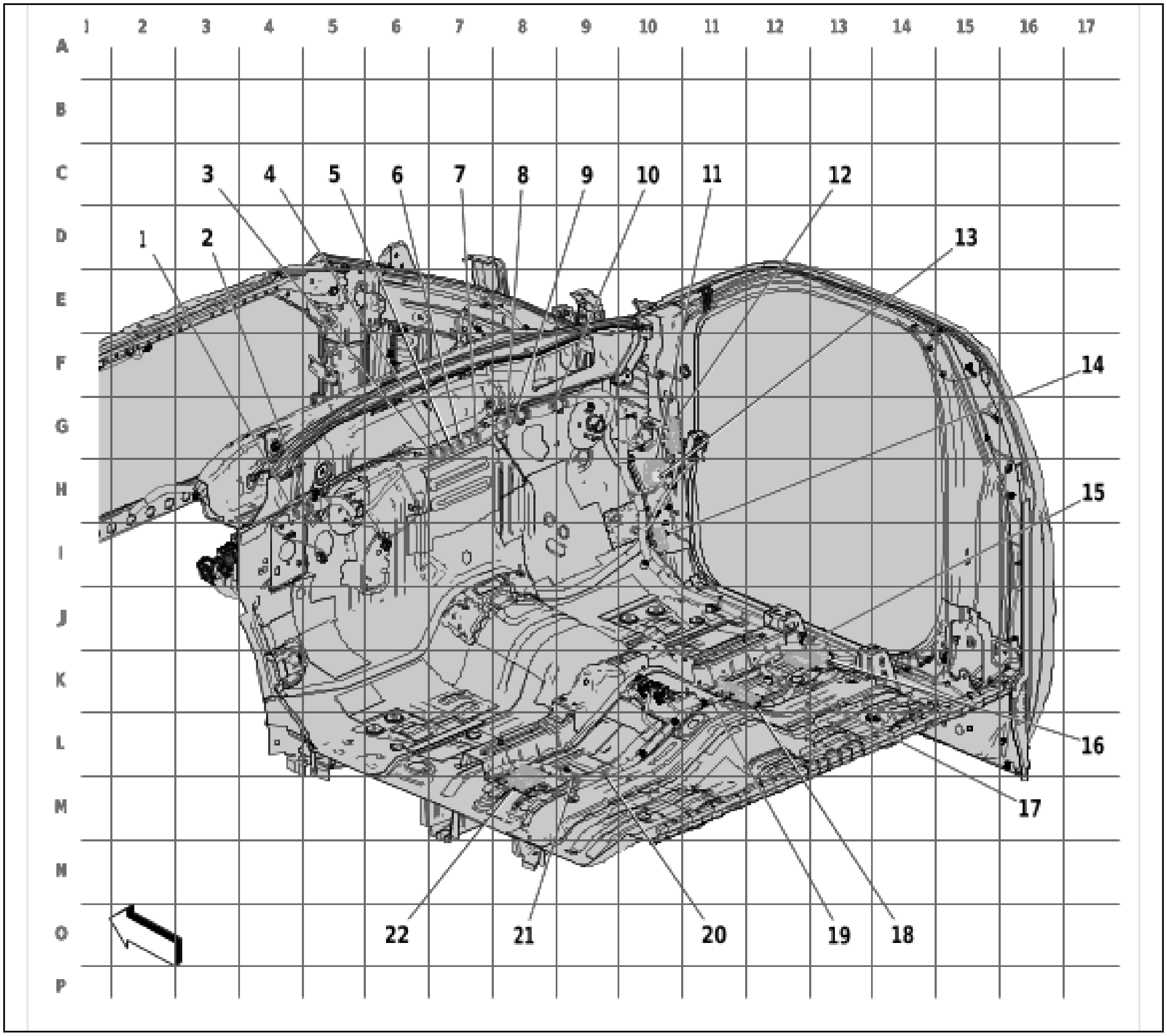
6215728

Items
(1) X324 Body Wiring Harness to Body Rear Wiring Harness Extension Harness (KI5)
(2) X340 Body Wiring Harness to Rear Seat Heater Control Wiring Harness (KA6)
(3) X309A Body Wiring Harness to Inside Rearview Mirror Wiring Harness
(4) X700 Rear Side Door Door Wiring Harness - Left to Body Wiring Harness (Double Cab / Crew Cab)
(5) X331 Front Seat Wiring Harness - Driver to Body Wiring Harness
(6) J336 Body Wiring Harness
(7) J327 Body Wiring Harness
(8) J312 Body Wiring Harness
(9) J311 Body Wiring Harness

Items
(10) J310 Body Wiring Harness
(11) J330 Body Wiring Harness
(12) J331 Body Wiring Harness
(13) J315 Body Wiring Harness
(14) J314 Body Wiring Harness
(15) J313 Body Wiring Harness
(16) X227 Front Floor Console Wiring Harness to Body Wiring Harness
(17) J333 Body Wiring Harness
(18) J334 Body Wiring Harness
(19) X336 Front Seat Wiring Harness - Passenger to Body Wiring Harness
(20) J325 Body Wiring Harness

Passenger Compartment - Body Wiring Harness - Right Front - Regular Cab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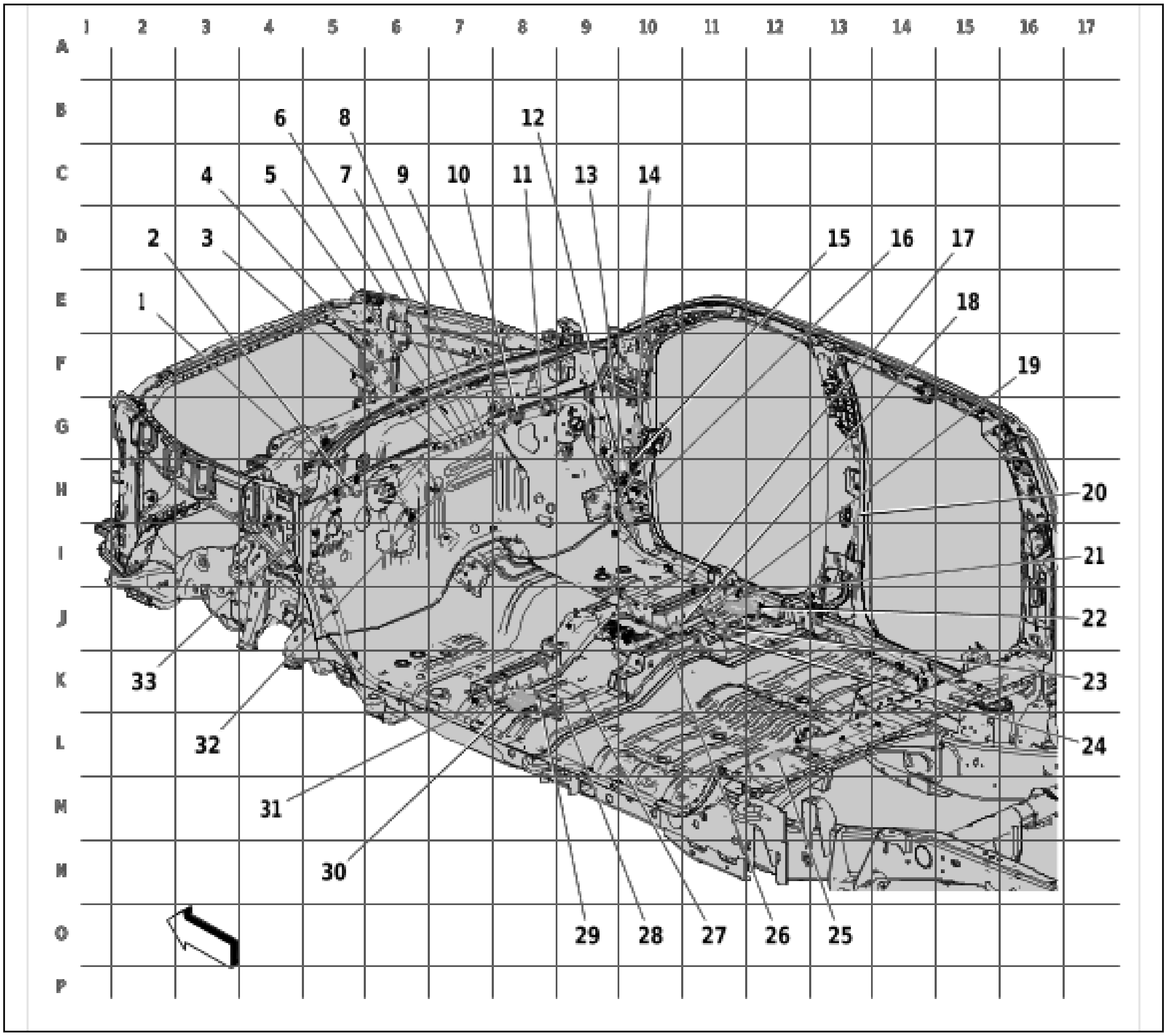
6215729

Items
(1) J303 Body Wiring Harness
(2) J302 Body Wiring Harness
(3) J307 Body Wiring Harness
(4) J306 Body Wiring Harness
(5) J305 Body Wiring Harness
(6) J304 Body Wiring Harness
(7) J322 Body Wiring Harness
(8) J321 Body Wiring Harness
(9) J320 Body Wiring Harness
(10) J319 Body Wiring Harness
(11) X211 Instrument Panel Wiring Harness to Body Wiring Harness
(12) X600 Front Side Door Door Wiring Harness - Right to Body Wiring Harness
(13) X217 Body Wiring Harness to Instrument Panel Wiring Harness
(14) X251 Auxiliary Heater Wiring Harness to Body Wiring Harness (C32)
(15) J323 Body Wiring Harness
(16) X336 Front Seat Wiring Harness - Passenger to Body Wiring Harness
(17) J325 Body Wiring Harness
(18) X227 Front Floor Console Wiring Harness to Body Wiring Harness
(19) J313 Body Wiring Harness
(20) J314 Body Wiring Harness
(21) J315 Body Wiring Harness
(22) X331 Front Seat Wiring Harness - Driver to Body Wiring Harness

Passenger Compartment - Body Wiring Harness - Right Front -Double Cab/Crew Cab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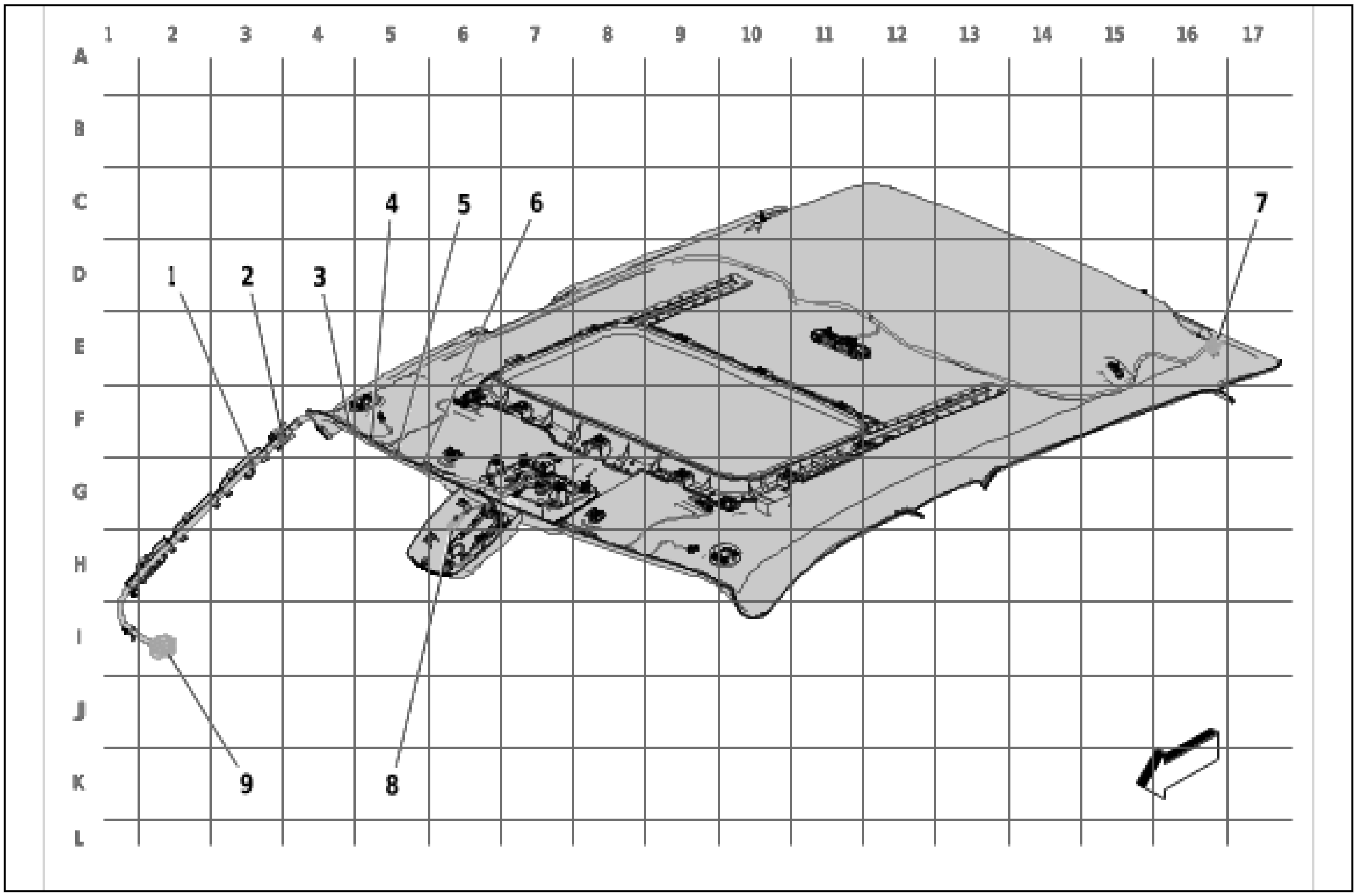
6215730

Items
(1) J326 Body Wiring Harness
(2) J302 Body Wiring Harness
(3) J307 Body Wiring Harness
(4) J306 Body Wiring Harness
(5) J305 Body Wiring Harness
(6) J304 Body Wiring Harness
(7) J329 Body Wiring Harness
(8) J322 Body Wiring Harness
(9) J385 Body Wiring Harness
(10) J320 Body Wiring Harness
(11) J319 Body Wiring Harness
(12) X211 Instrument Panel Wiring Harness to Body Wiring Harness

Items
(13) X217 Body Wiring Harness to Instrument Panel Wiring Harness
(14) X600 Front Side Door Door Wiring Harness - Right to Body Wiring Harness
(15) X218 Instrument Panel Wiring Harness to Body Wiring Harness
(16) X251 Auxiliary Heater Wiring Harness to Body Wiring Harness (C32)
(17) J332 Body Wiring Harness
(18) X227 Front Floor Console Wiring Harness to Body Wiring Harness
(19) J334 Body Wiring Harness
(20) X800 Rear Side Door Door Wiring Harness - Right to Body Wiring Harness (Double Cab / Crew Cab)
(21) J323 Body Wiring Harness
(22) X336 Front Seat Wiring Harness - Passenger to Body Wiring Harness
(23) J325 Body Wiring Harness
(24) J333 Body Wiring Harness
(25) X340 Body Wiring Harness to Rear Seat Heater Control Wiring Harness (KA6)
(26) J313 Body Wiring Harness
(27) J314 Body Wiring Harness
(28) J315 Body Wiring Harness
(29) J331 Body Wiring Harness
(30) X331 Front Seat Wiring Harness - Driver to Body Wiring Harness
(31) J330 Body Wiring Harness
(32) J321 Body Wiring Harness
(33) J303 Body Wiring Harness

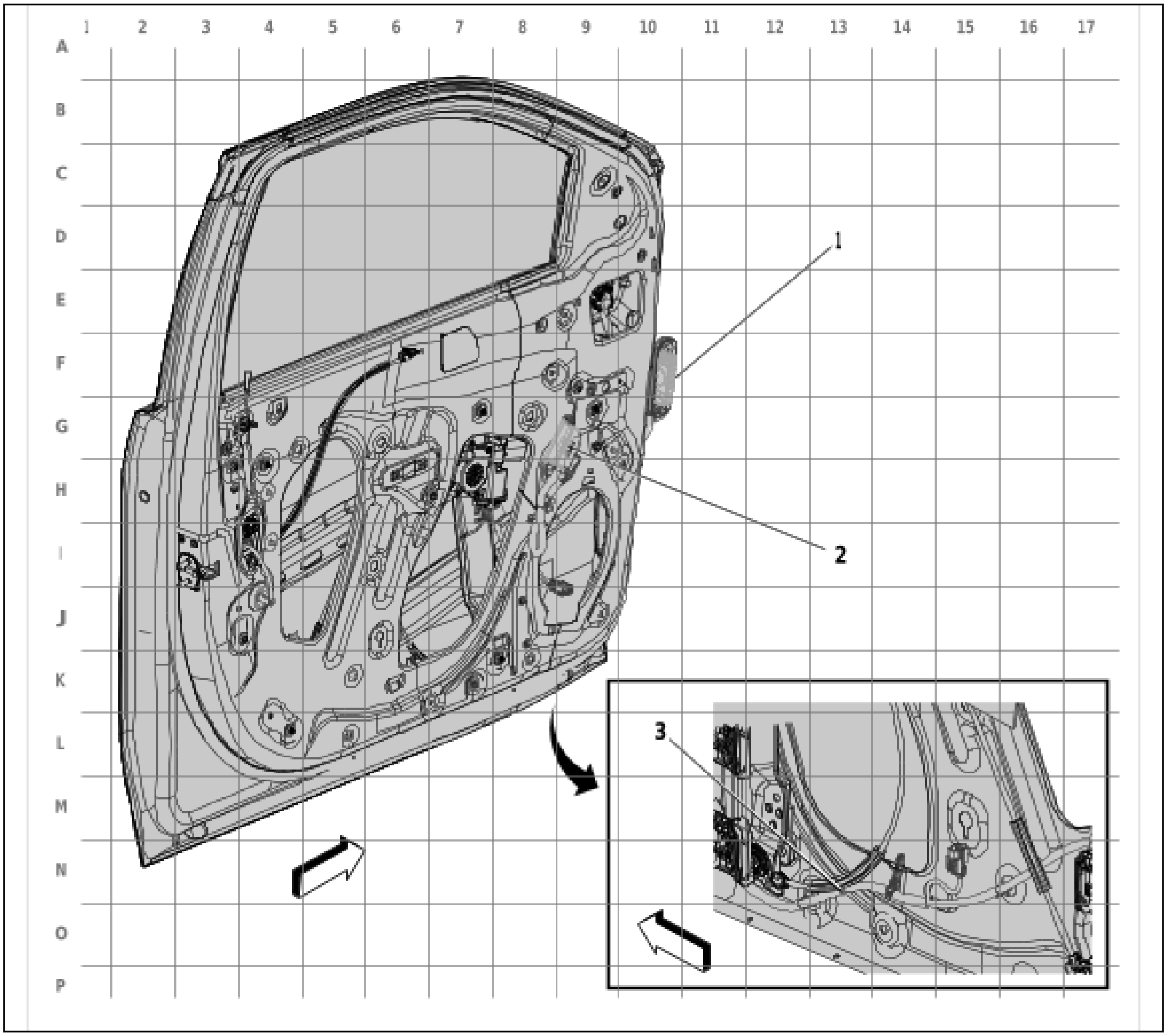
Roof - Dome Lamp Wiring Harness - Double Cab



6215737

Items
(1) J364 Dome Lamp Wiring Harness
(2) J363 Dome Lamp Wiring Harness
(3) J365 Dome Lamp Wiring Harness
(4) J366 Dome Lamp Wiring Harness
(5) J367 Dome Lamp Wiring Harness
(6) J368 Dome Lamp Wiring Harness
(7) X371A Inside Rearview Mirror Wiring Harness to Dome Lamp Wiring Harness
(8) X382 Windshield Outside Moisture_Ambient Light and Humidity Sensor to Dome Lamp Wiring Harness (ASV)
(9) X370A Dome Lamp Wiring Harness to Instrument Panel Wiring Harness (-GD2 / GD3 / GD5)

Door Harness Routing - Driver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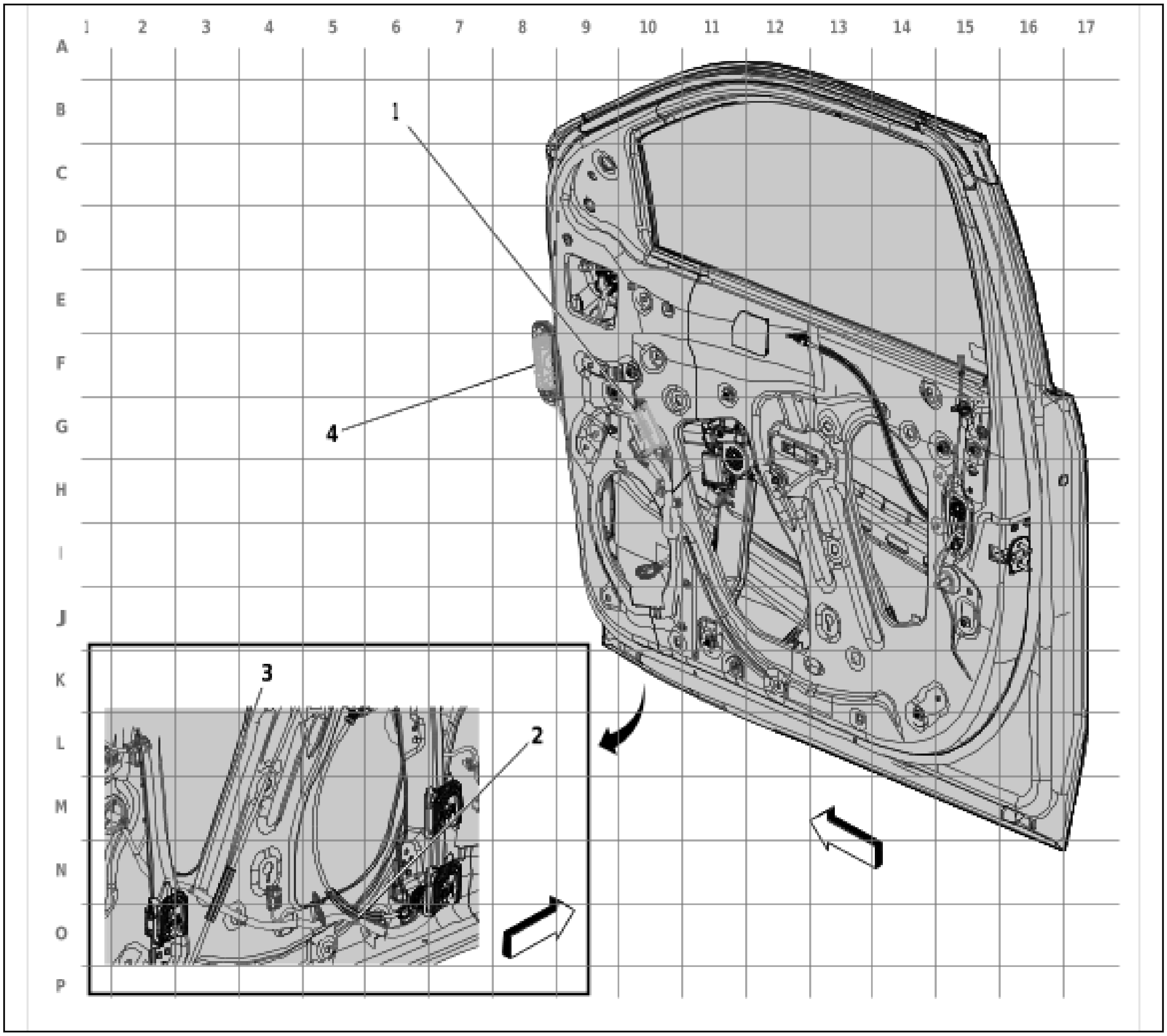
6343106

Items
(1) X500 Front Side Door Door Wiring Harness - Left to Body Wiring Harness
(2) X505 Front Side Door Door Wiring Harness - Left to Front Side Door Door Lock Door Wiring Harness - Left
(3) J501 Front Side Door Door Wiring Harness - Driver

Door Harness Routing - Passenger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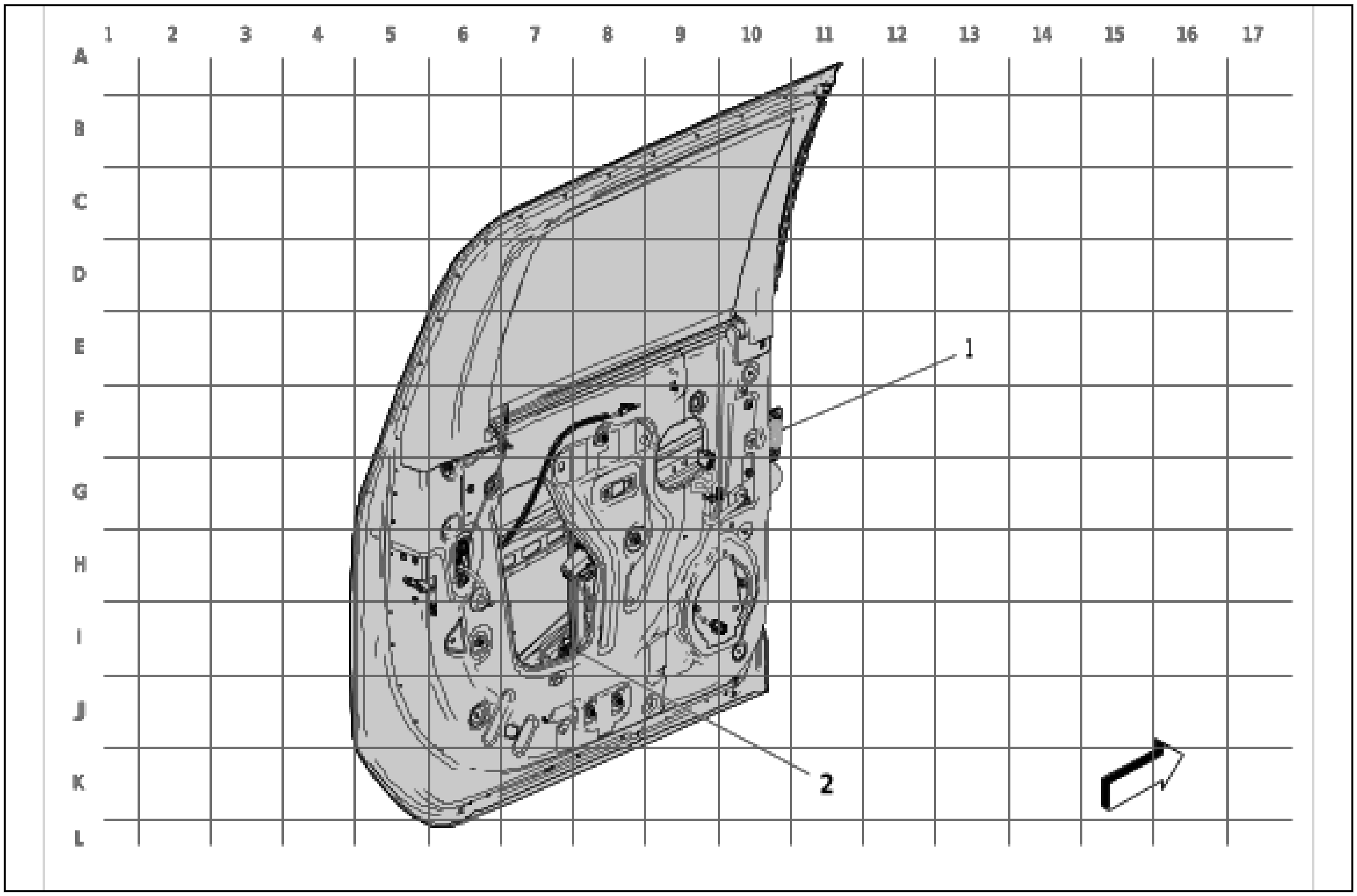
6343107

Items
(1) X605 Front Side Door Door Wiring Harness - Right to Front Side Door Door Lock Door Wiring Harness - Right
(2) J601 Front Side Door Door Wiring Harness - Passenger
(3) J602 Front Side Door Door Wiring Harness - Passenger
(4) X600 Front Side Door Door Wiring Harness - Right to Body Wiring Harness

Door Harness Routing - Left Rear - Crew/Extended Cab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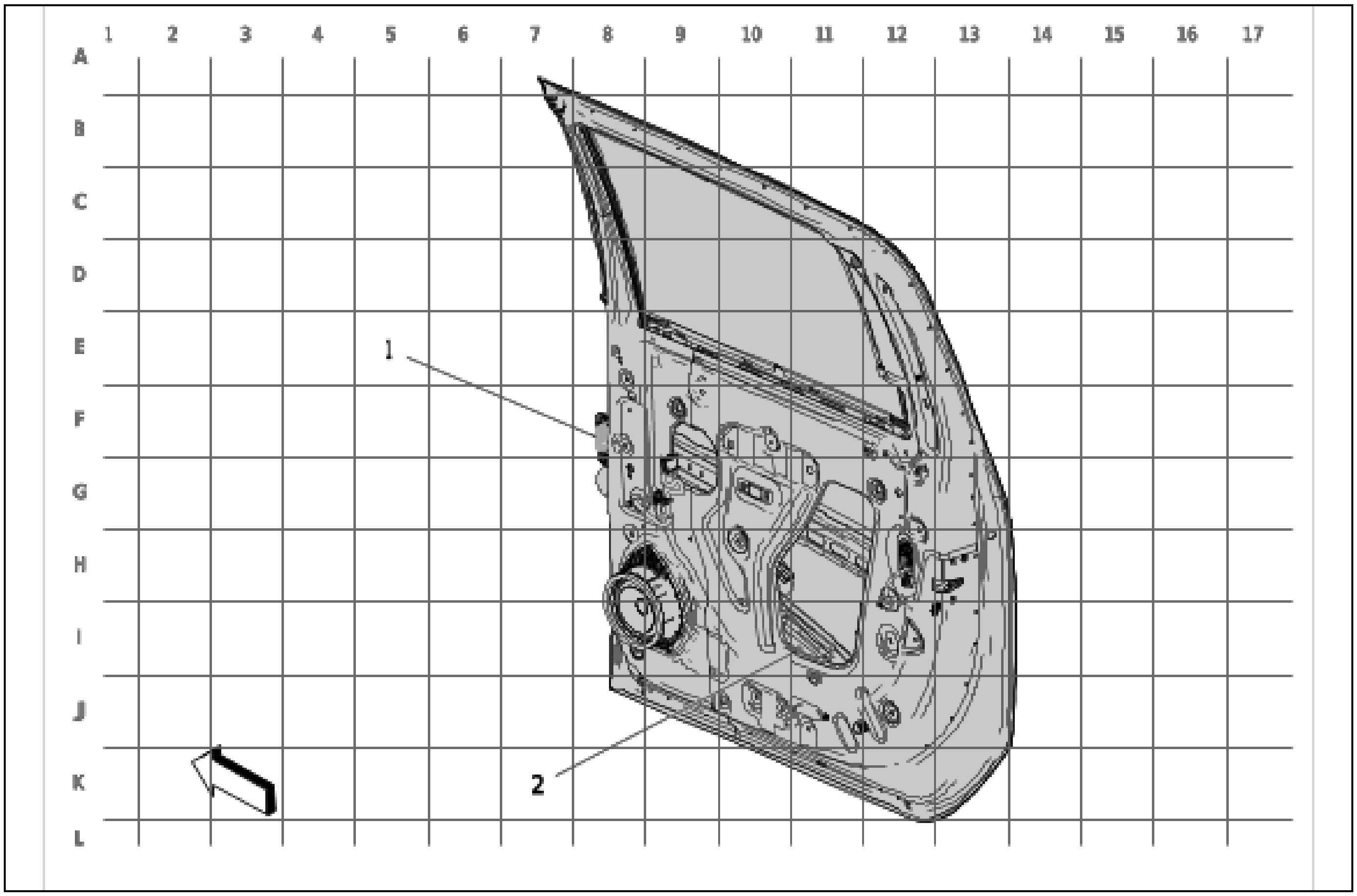
6343108

Items
(1) X700 Rear Side Door Door Wiring Harness - Left to Body Wiring Harness (Double Cab / Crew Cab)
(2) J700 Rear Side Door Door Wiring Harness - Left

Door Harness Routing - Right Rear - Crew/Extended Cab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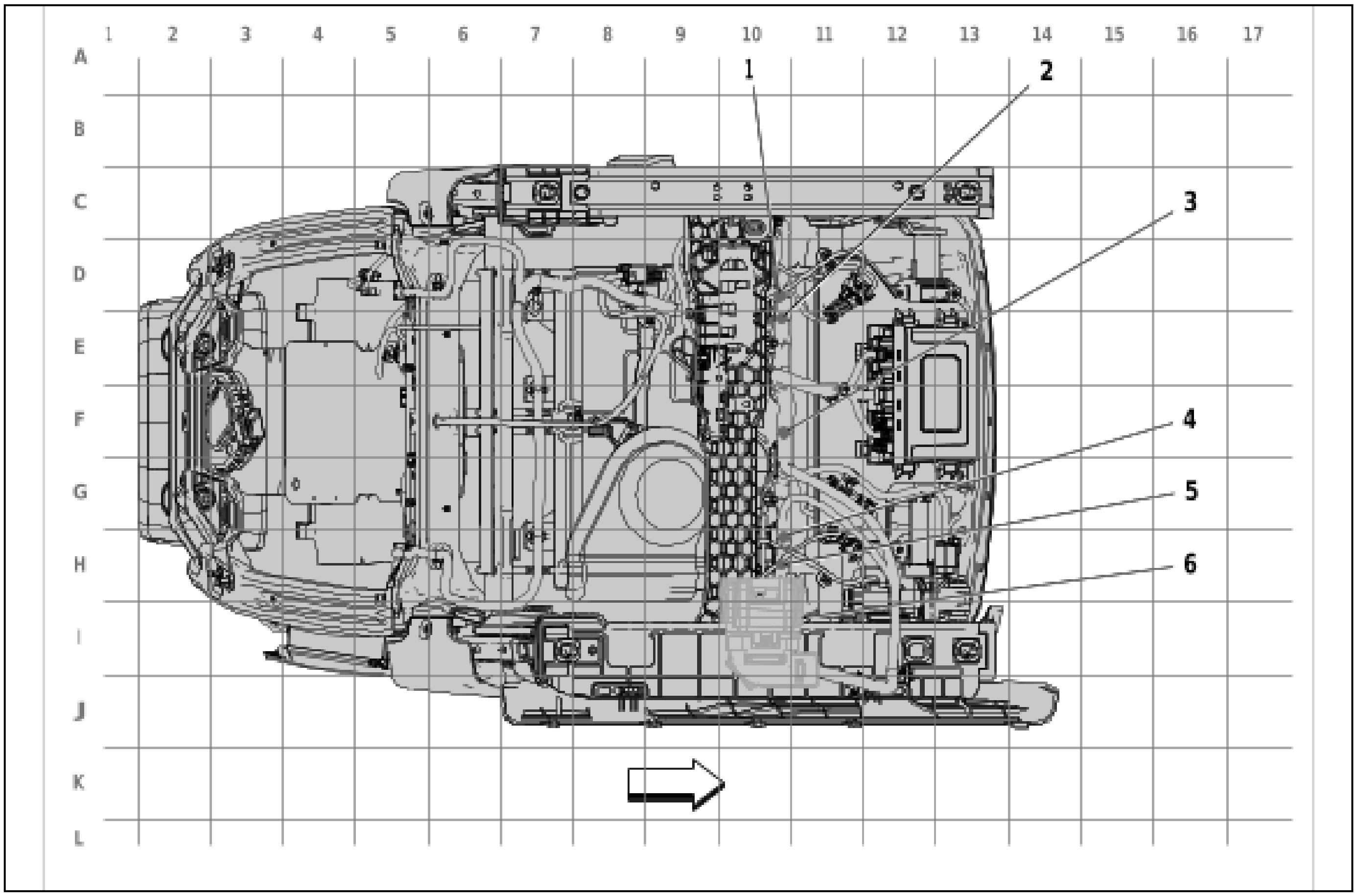
6343110

Items
(1) X800 Rear Side Door Door Wiring Harness - Right to Body Wiring Harness (Double Cab / Crew Cab)
(2) J800 Rear Side Door Door Wiring Harness - Right

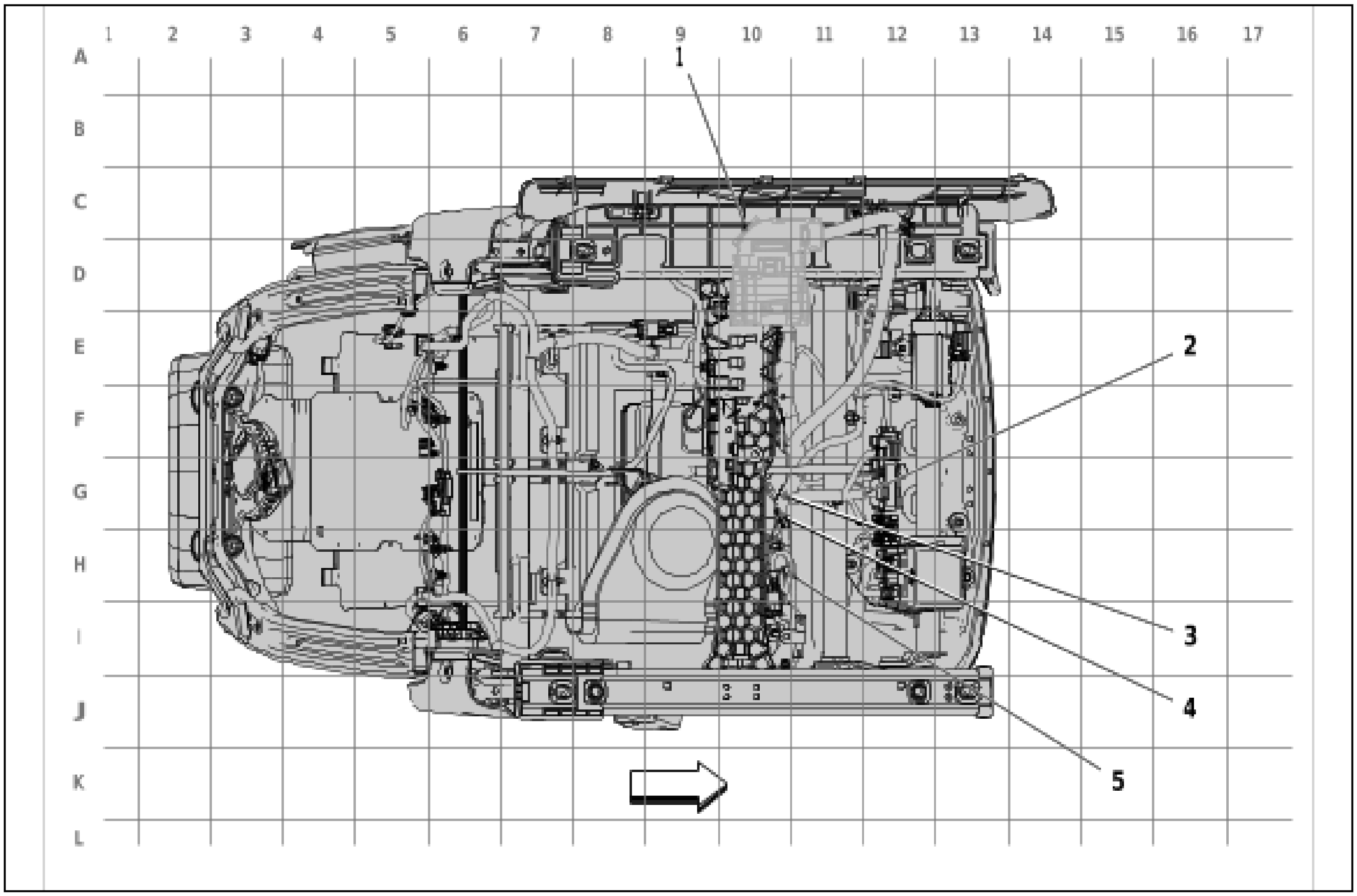
Driver Seat Harness Routing



6505917

Items
(1) J375 Front Seat Wiring Harness - Driver
(2) J376 Front Seat Wiring Harness - Driver
(3) J373 Front Seat Wiring Harness - Driver
(4) J372 Front Seat Wiring Harness - Driver
(5) J371 Front Seat Wiring Harness - Driver
(6) X331 Front Seat Wiring Harness - Driver to Body Wiring Harness

Passenger Seat Harness Routing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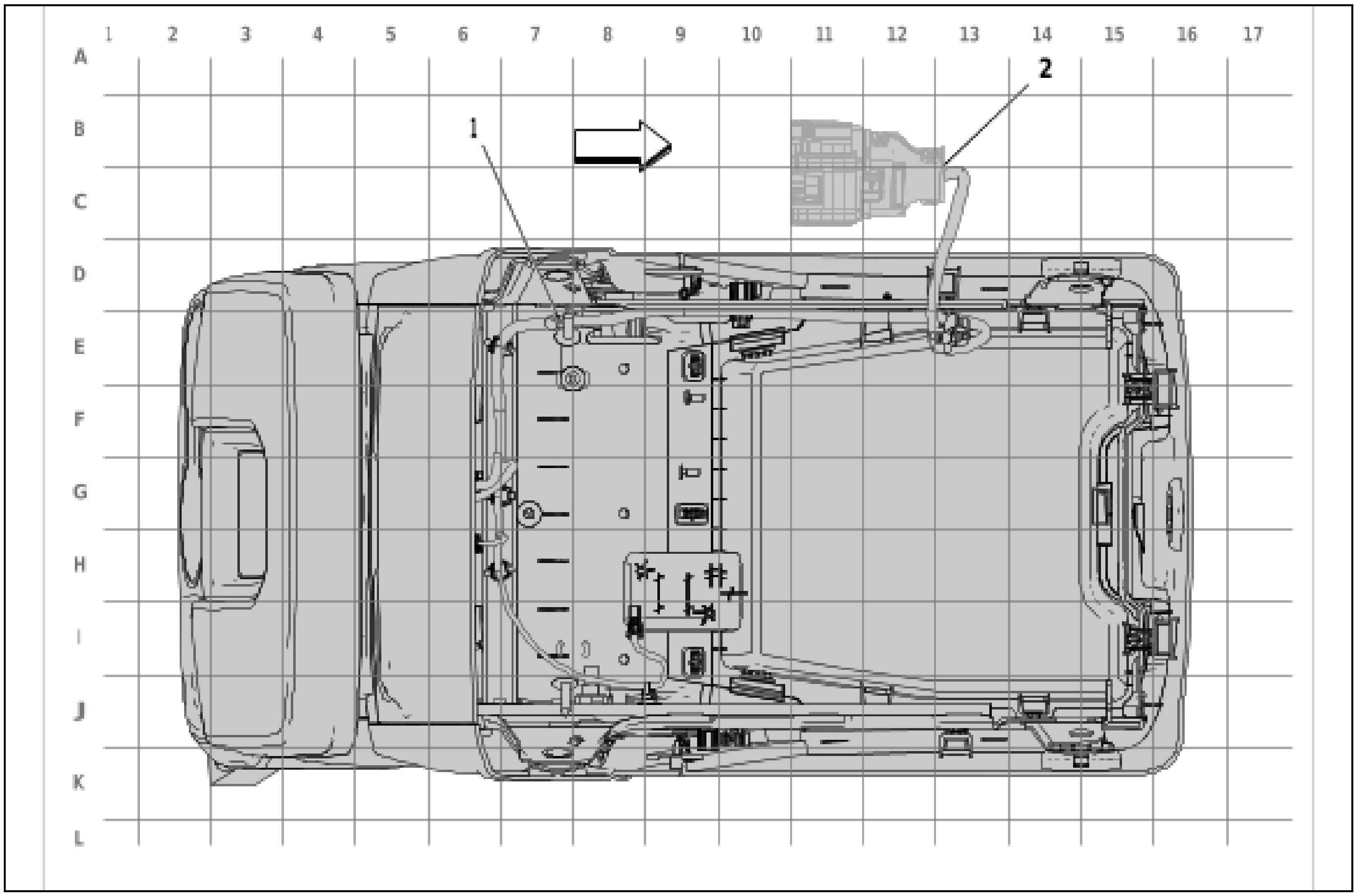
6398243

Items
(1) X336 Front Seat Wiring Harness - Passenger to Body Wiring Harness
(2) J378 Front Seat Wiring Harness - Passenger
(3) J380 Front Seat Wiring Harness - Passenger
(4) J379 Front Seat Wiring Harness - Passenger
(5) J377 Front Seat Wiring Harness - Passenger

Front Center Seat Harness Routing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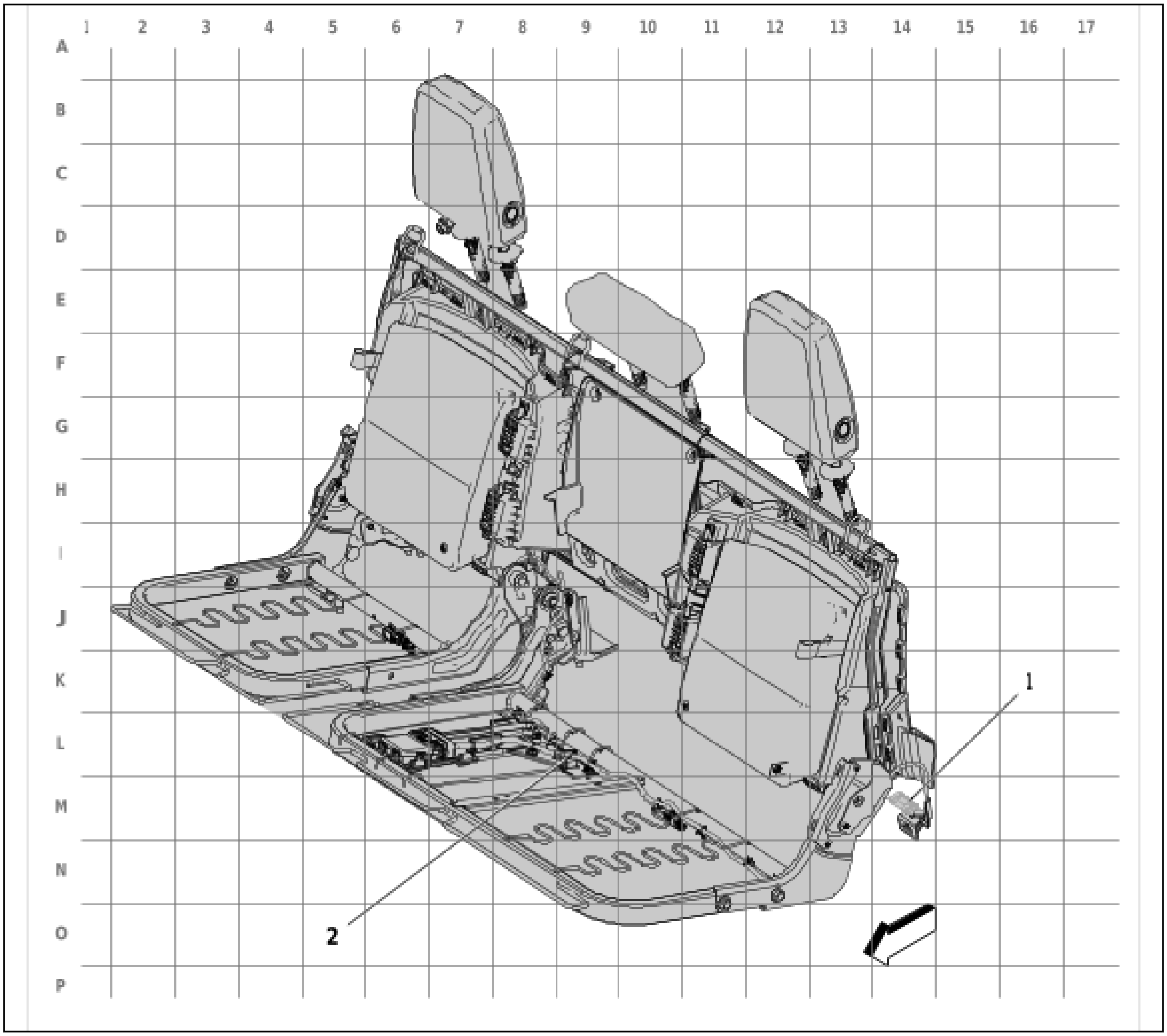
6398245

Items
(1) J369 Front Seat Wiring Harness - Center (AZ3)
(2) X227 Front Floor Console Wiring Harness to Body Wiring Harness

Rear Seat Harness Routing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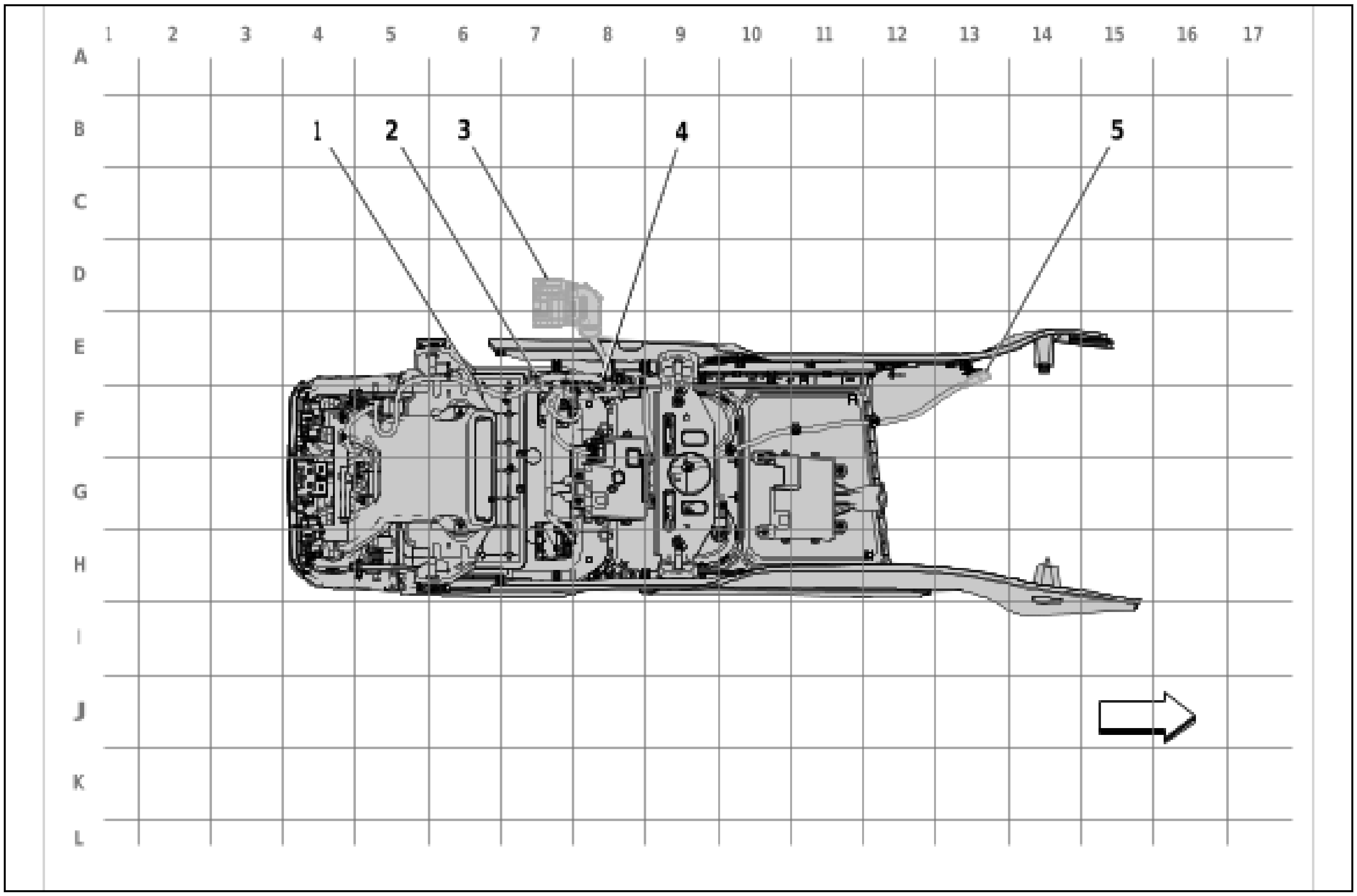
6398246

Items
(1) X340 Body Wiring Harness to Rear Seat Heater Control Wiring Harness (KA6)
(2) J388 Rear Seat Heater Control Wiring Harness

Center Console - Front Floor Console Wiring Harness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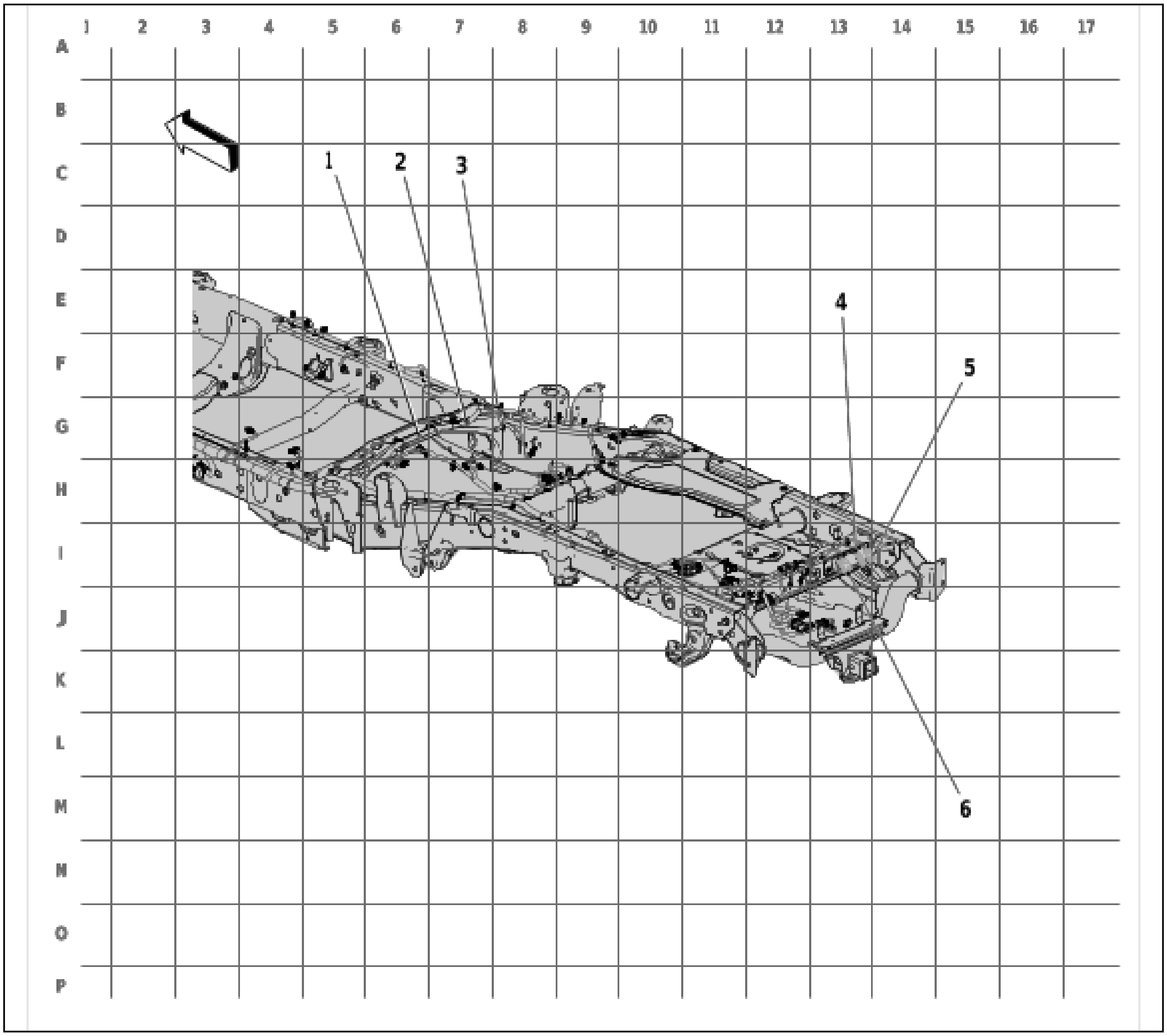
6505918

Items
(1) J339 Front Floor Console Wiring Harness
(2) J337 Front Floor Console Wiring Harness
(3) X227 Front Floor Console Wiring Harness to Body Wiring Harness
(4) J336 Body Wiring Harness
(5) X226 Front Floor Console Wiring Harness to Instrument Panel Wiring Harness (D07)

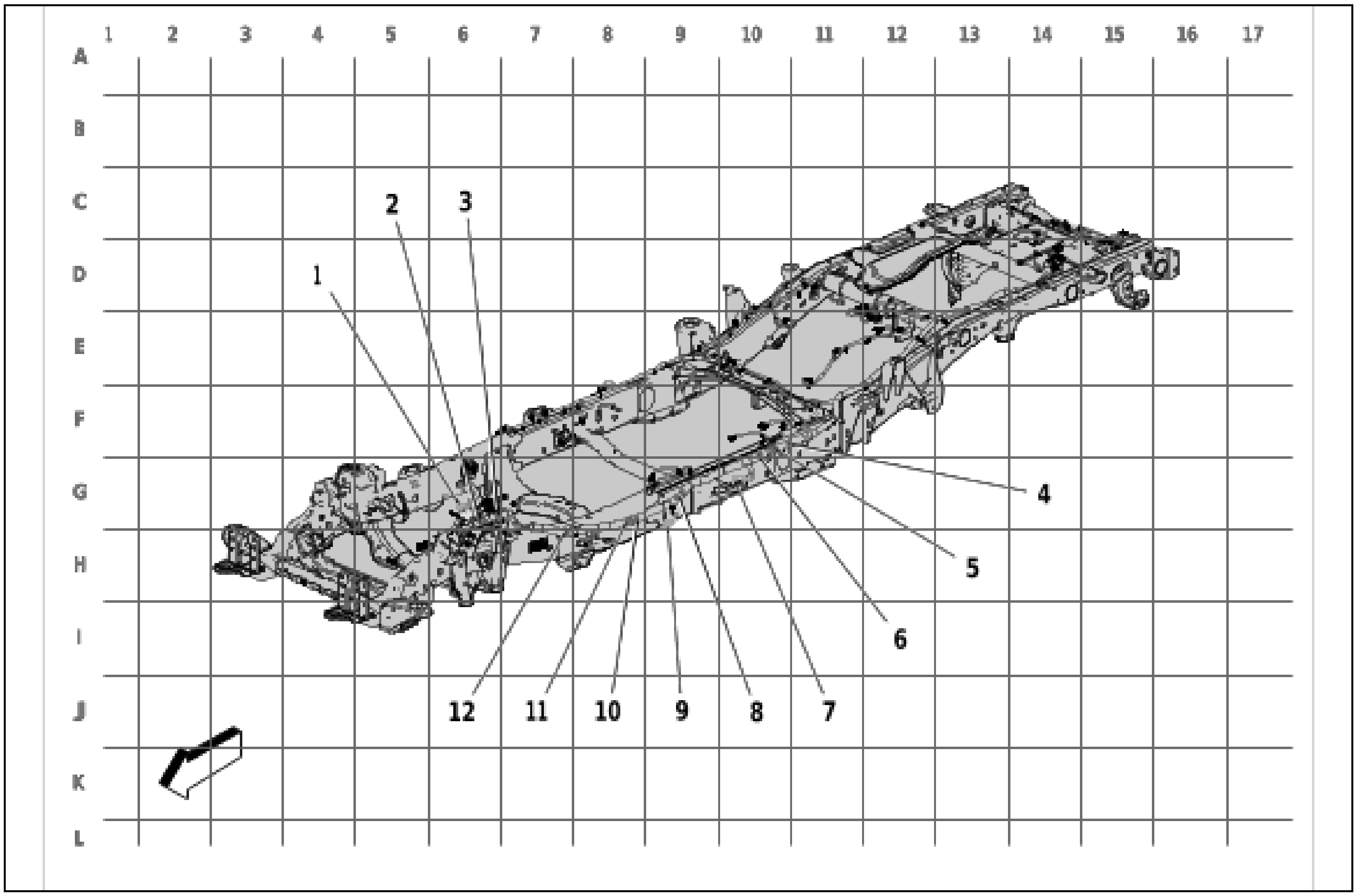
Vehicle Underbody - Chassis Wiring Harness - Rear - Double Cab/Crew Cab



6215745

Items
(1) J342 Chassis Wiring Harness
(2) J341 Chassis Wiring Harness
(3) J344 Chassis Wiring Harness (L5P)
(4) X414 Chassis Rear Wiring Harness to Chassis Wiring Harness (KC9 / KCA)
(5) X920A Tail Lamp Wiring Harness - Right to Chassis Wiring Harness
(6) X950 Rear Object Alarm Sensor Wiring Harness to Chassis Wiring Harness

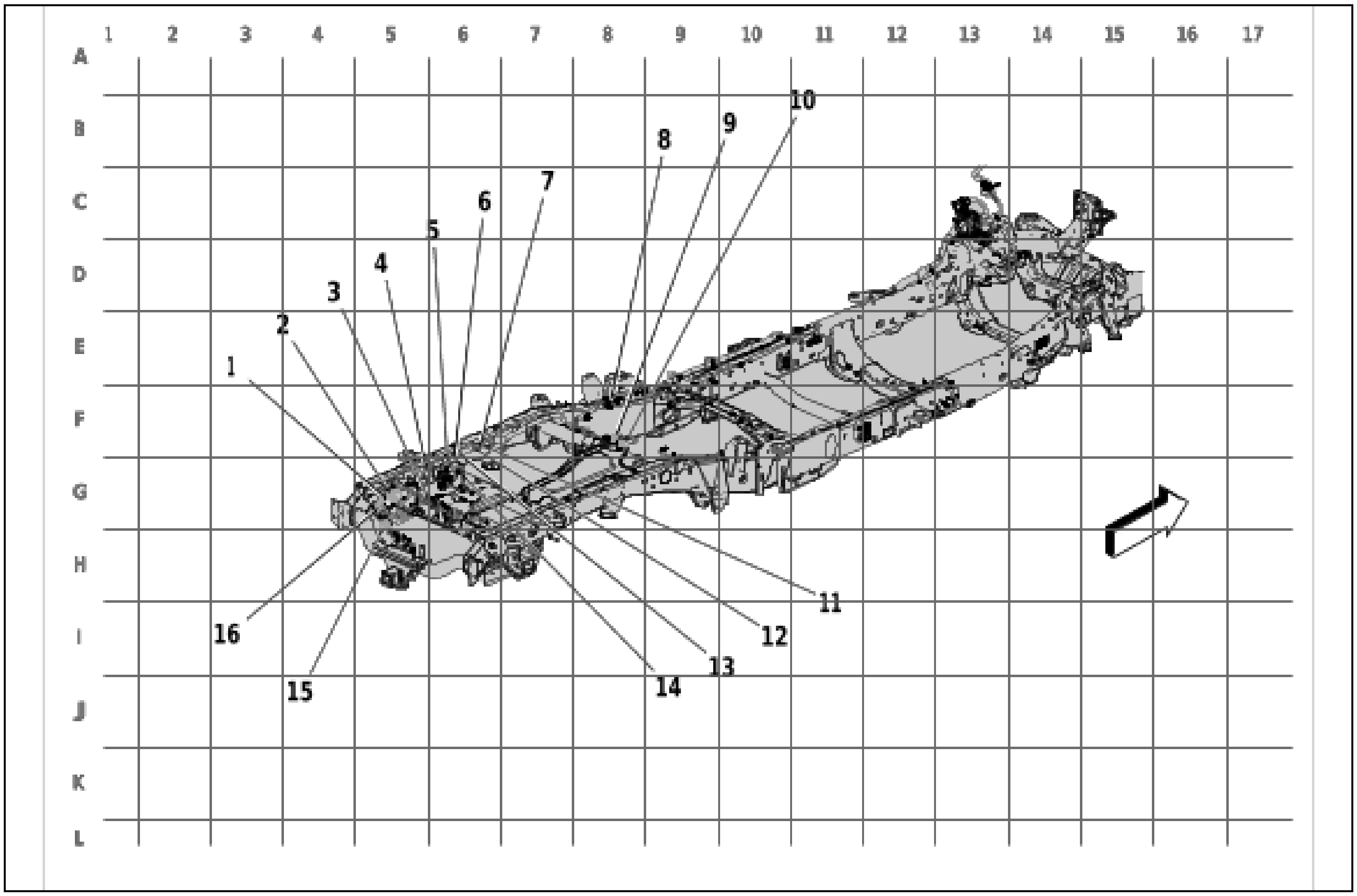
Vehicle Underbody - Chassis Wiring Harness - Left - Double Cab/Crew Cab



6215746

Items
(1) X426 Chassis Wiring Harness to Chassis Wiring Harness
(2) J352 Chassis Wiring Harness
(3) J353 Chassis Wiring Harness
(4) J345 Chassis Wiring Harness
(5) J356 Chassis Wiring Harness
(6) J355 Chassis Wiring Harness
(7) X404 Chassis Wiring Harness to Emission Reduction Fluid Tank Reservoir Wire Harness (L5P)
(8) J350 Chassis Wiring Harness (L5P)
(9) X412 Assist Step Motor jumper to Chassis Wiring Harness (BRS)
(10) J351 Chassis Wiring Harness
(11) J354 Chassis Wiring Harness (FHS)
(12) J340 Chassis Wiring Harness

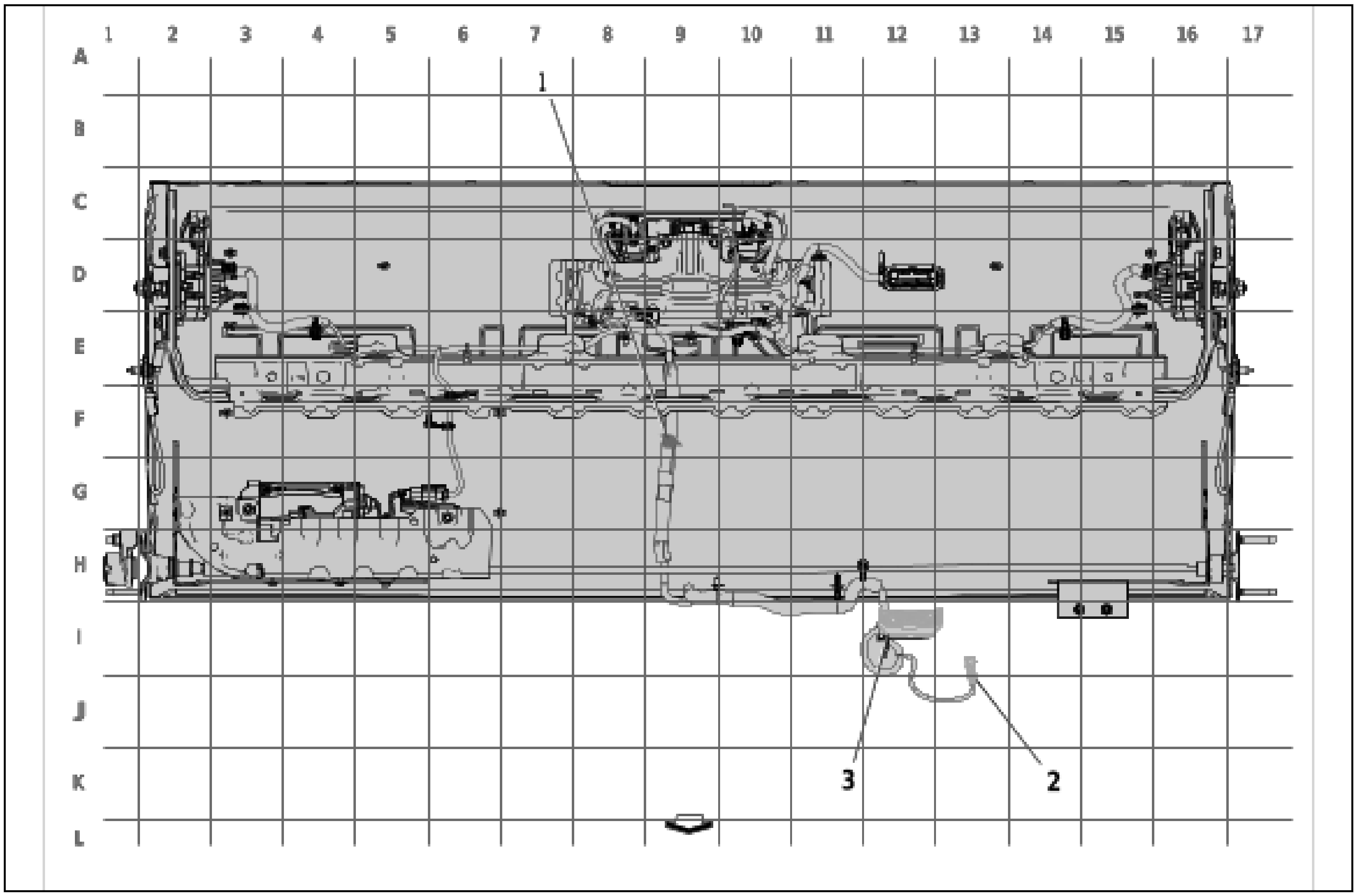
Vehicle Underbody - Chassis Wiring Harness - Right - Double Cab/Crew Cab



6215747

Items
(1) X919 Endgate Wiring Harness to Chassis Wiring Harness
(2) X918 Endgate Wiring Harness to Chassis Wiring Harness
(3) J348 Chassis Wiring Harness
(4) J362 Chassis Wiring Harness
(5) J361 Chassis Wiring Harness
(6) J360 Chassis Wiring Harness
(7) J345 Chassis Wiring Harness
(8) J347 Chassis Wiring Harness (L5P)
(9) X420B Chassis Rear Wiring Harness Extension Harness to Chassis Wiring Harness
(10) X420A Chassis Rear Wiring Harness Extension Harness to Chassis Wiring Harness
(11) J358 Chassis Wiring Harness (BRS)
(12) J357 Chassis Wiring Harness
(13) J359 Chassis Wiring Harness
(14) J349 Chassis Wiring Harness
(15) X480 Chassis Wiring Harness to Trailer Rear Wiring Harness
(16) X910A Tail Lamp Wiring Harness - Left to Chassis Wiring Harness

Rear of Vehicle - Endgate Wiring Harness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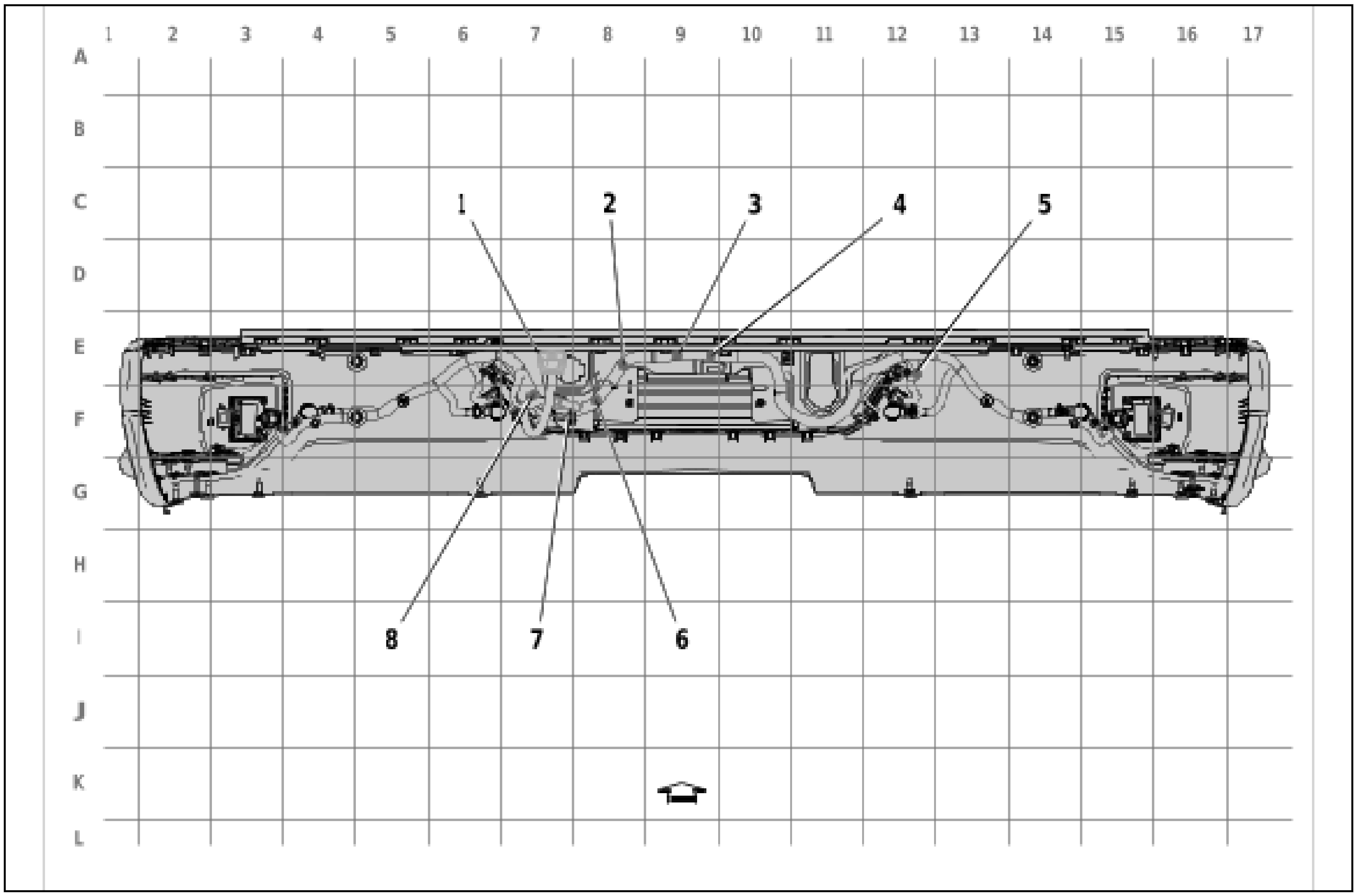
6215751

Items
(1) J900 Endgate Wiring Harness
(2) X919 Endgate Wiring Harness to Chassis Wiring Harness
(3) X918 Endgate Wiring Harness to Chassis Wiring Harness

Rear of Vehicle - Rear Object Alarm Sensor Harness

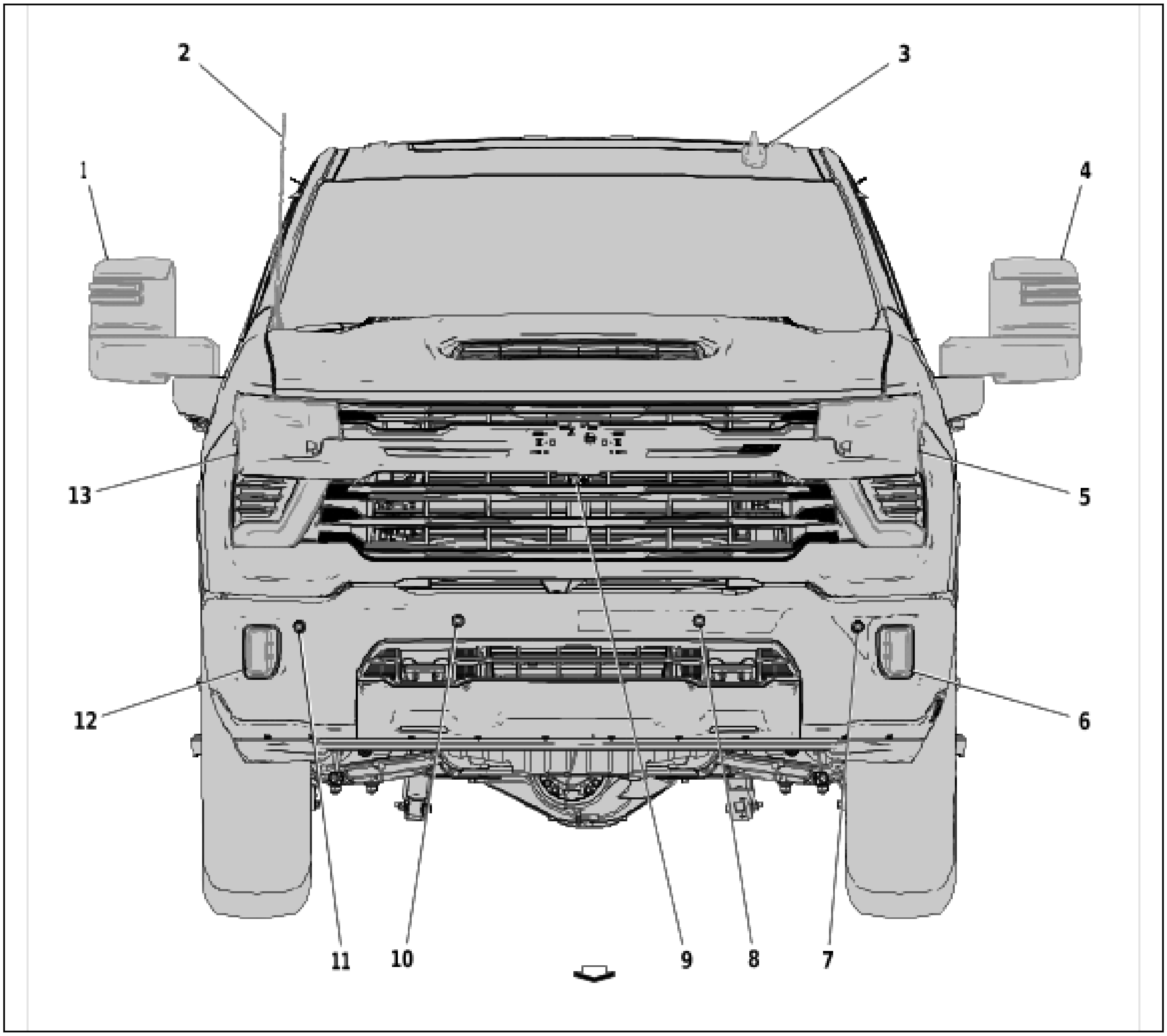


6215752

Items
(1) X950 Rear Object Alarm Sensor Wiring Harness to Chassis Wiring Harness
(2) J907 Rear Object Alarm Sensor Wiring Harness
(3) J906 Rear Object Alarm Sensor Wiring Harness
(4) J905 Rear Object Alarm Sensor Wiring Harness
(5) J904 Rear Object Alarm Sensor Wiring Harness
(6) J908 Rear Object Alarm Sensor Wiring Harness
(7) R6A Terminating Resistor - High Speed Bus (UKL / (-UKC - UKV))
(8) J909 Rear Object Alarm Sensor Wiring Harness

Component Locator

Front of Vehicle Components

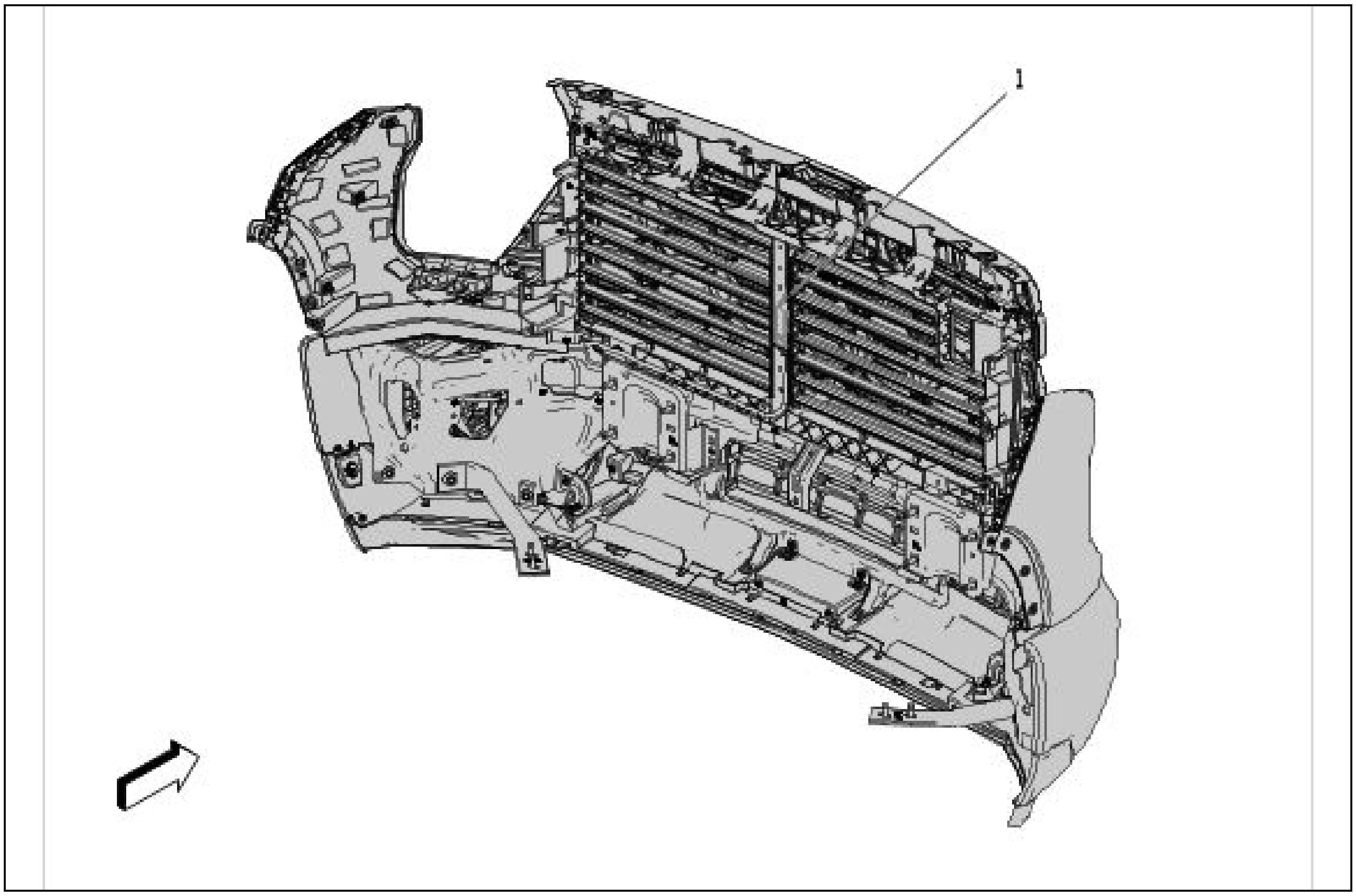


6215754

Items
(1) A9B Outside Rearview Mirror - Passenger
(2) T4M Radio Antenna
(3) T4P High Frequency Antenna
(4) A9A Outside Rearview Mirror - Driver
(5) E13LA Front Headlamp - Left
(6) E29LF Front Fog Lamp - Left (T3U)
(7) B306A Parking Assist Alarm Sensor - Front Left Outer (UD5)
(8) B306B Parking Assist Alarm Sensor - Front Left Middle (UD5)
(9) B174G Front View Driver Information Camera - Grille (UV2)

Items
(10) B306C Parking Assist Alarm Sensor - Front Right Middle (UD5)
(11) B306D Parking Assist Alarm Sensor - Front Right Outer (UD5)
(12) E29RF Front Fog Lamp - Right (T3U)
(13) E13RA Front Headlamp - Right

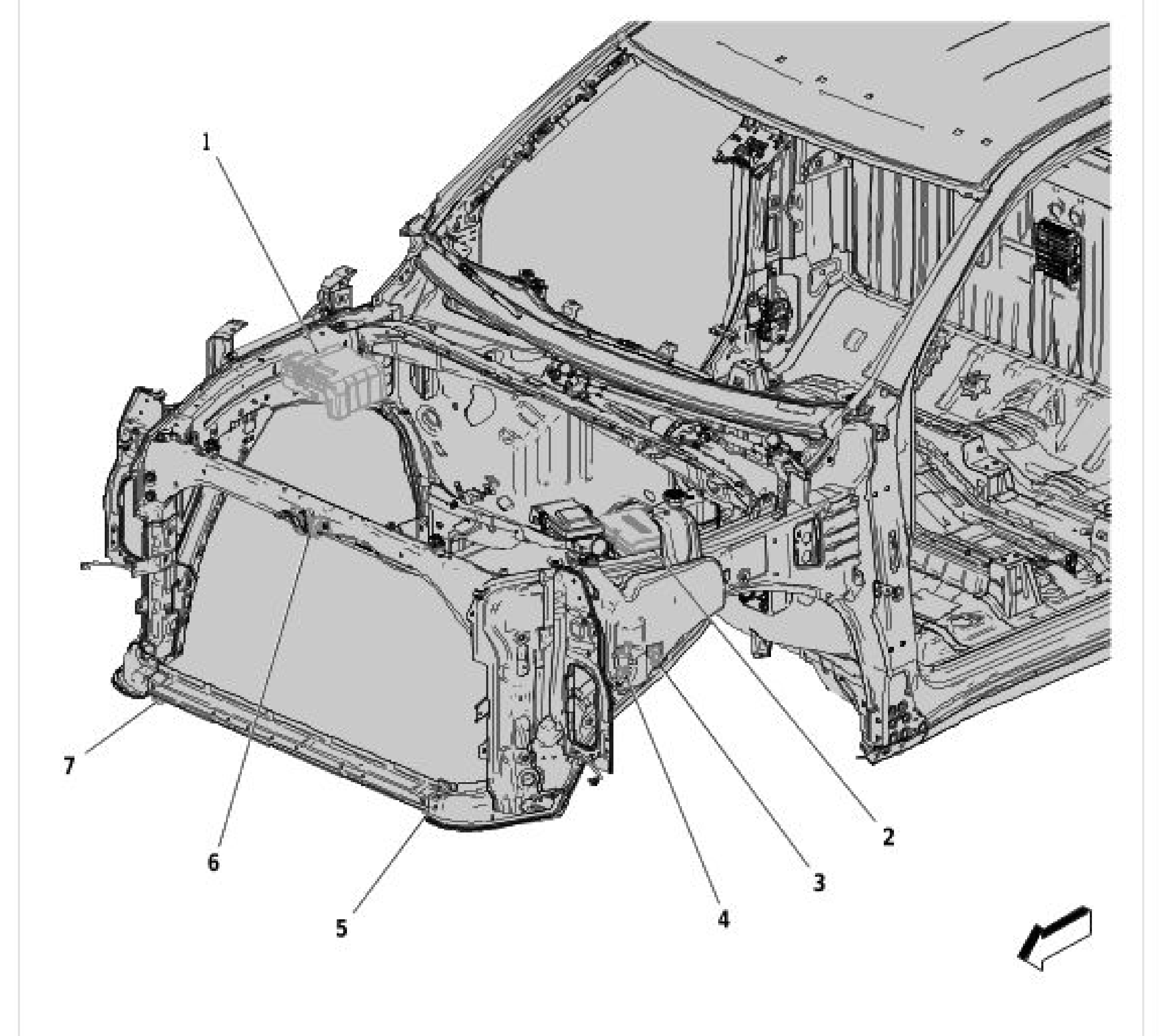
Front Fascia Components - Inside



6215757

Items
(1) M96A Active Grille Air Shutter Actuator 1 (VTI)

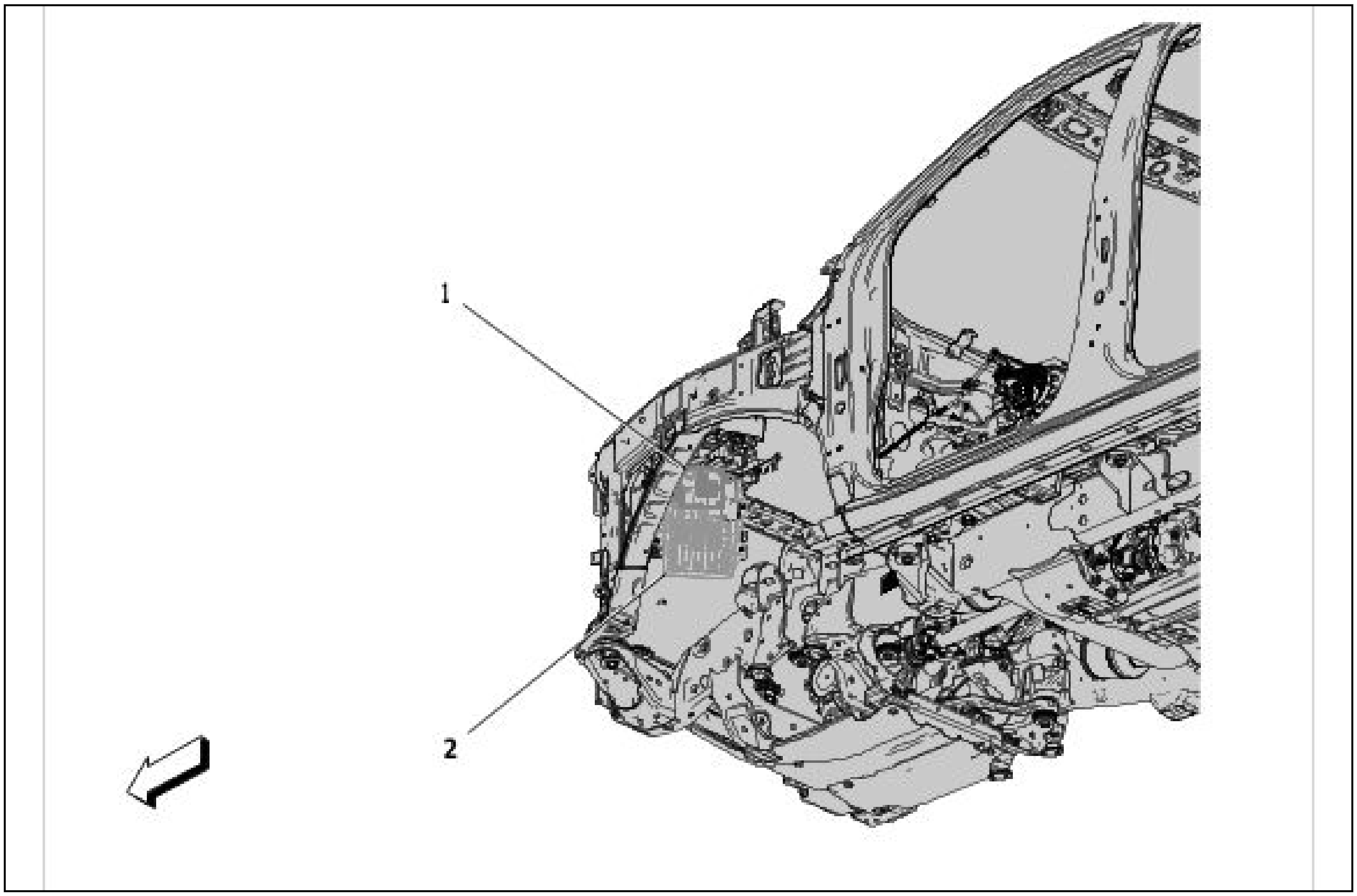
Engine Compartment Components - Left 1 of 2



6215760

Items
(1) X50B Battery Distribution Engine Compartment Fuse Block
(2) X50A Engine Wiring Harness Junction Block
(3) B118 Windshield Washer Solvent Container Level Sensor
(4) G24 Windshield Washer Pump
(5) B58L Airbag Front End Discriminating Sensor - Left
(6) B55 Engine Compartment Cover Switch
(7) B58R Airbag Front End Discriminating Sensor - Right

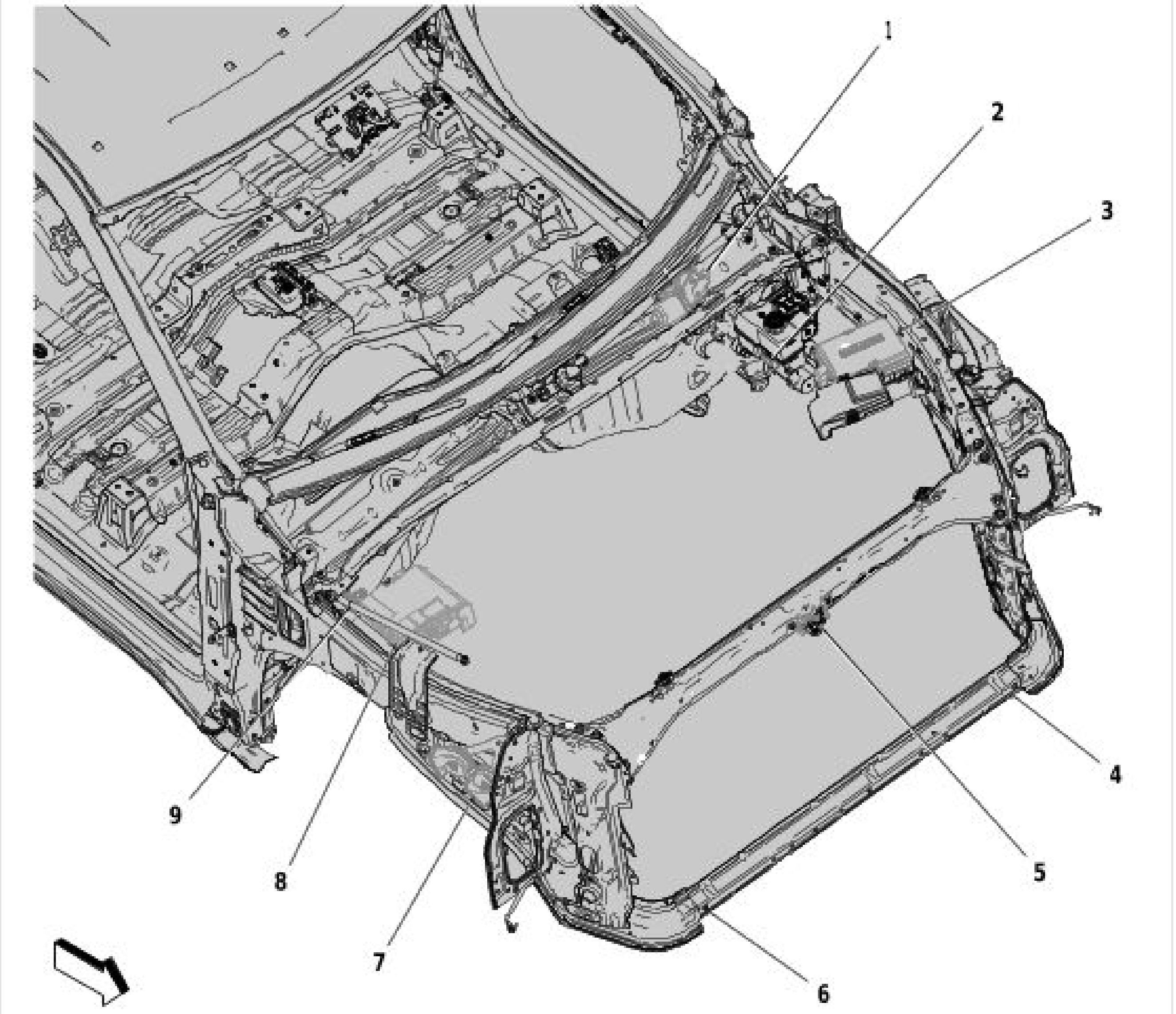
Engine Compartment Components - Left 2 of 2



6215761

Items
(1) K69 Transfer Case Control Module (NQF / NQH)
(2) K20 Engine Control Module

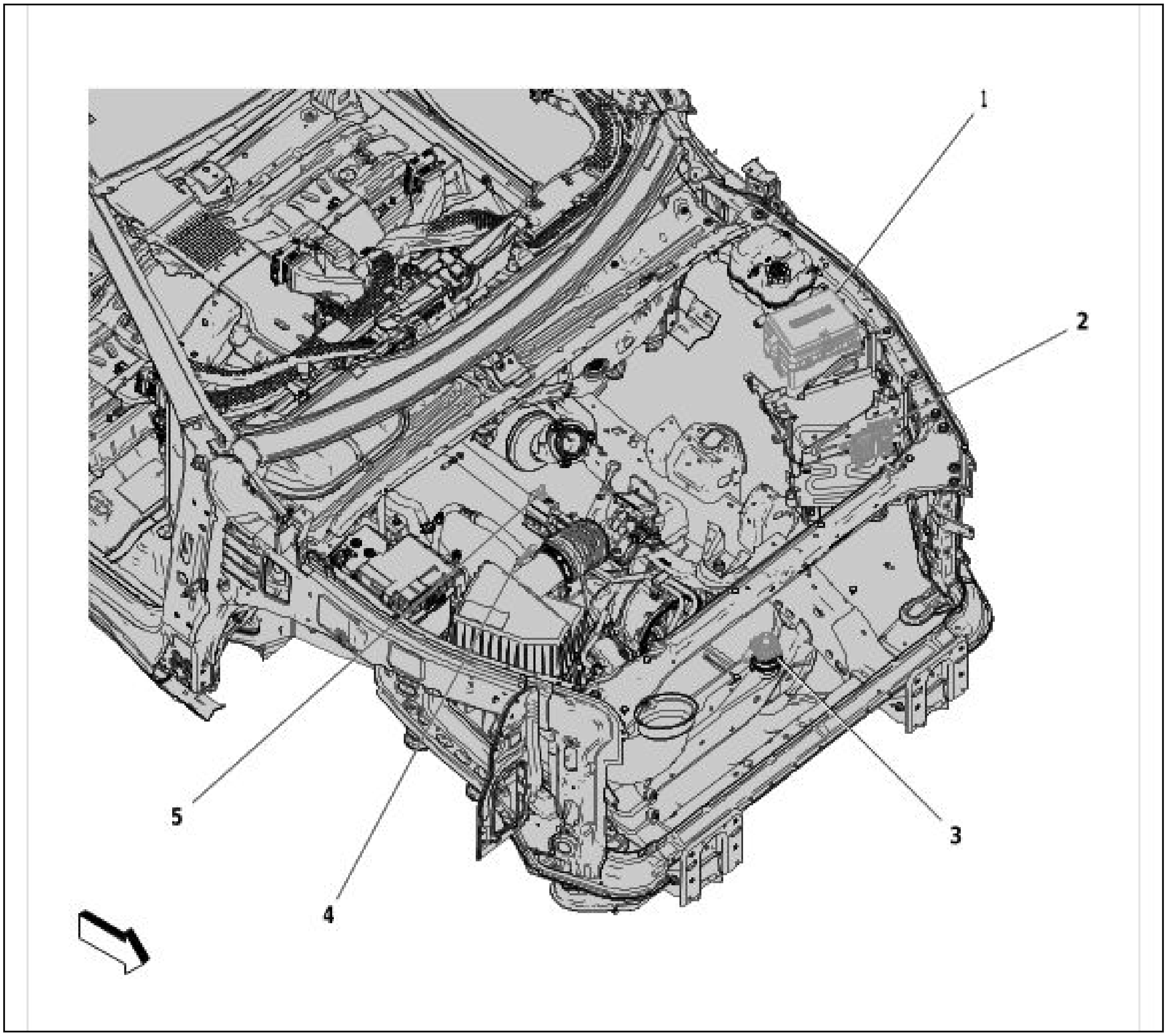
Engine Compartment Components - Top 1 of 2



6215762

Items
(1) M75 Windshield Wiper Motor
(2) B20A Brake Fluid Level Indicator Switch
(3) X50A Engine Wiring Harness Junction Block
(4) B58L Airbag Front End Discriminating Sensor - Left
(5) B55 Engine Compartment Cover Switch
(6) B58R Airbag Front End Discriminating Sensor - Right
(7) P13 Horn
(8) X50B Battery Distribution Engine Compartment Fuse Block
(9) B110 Battery Monitor Module

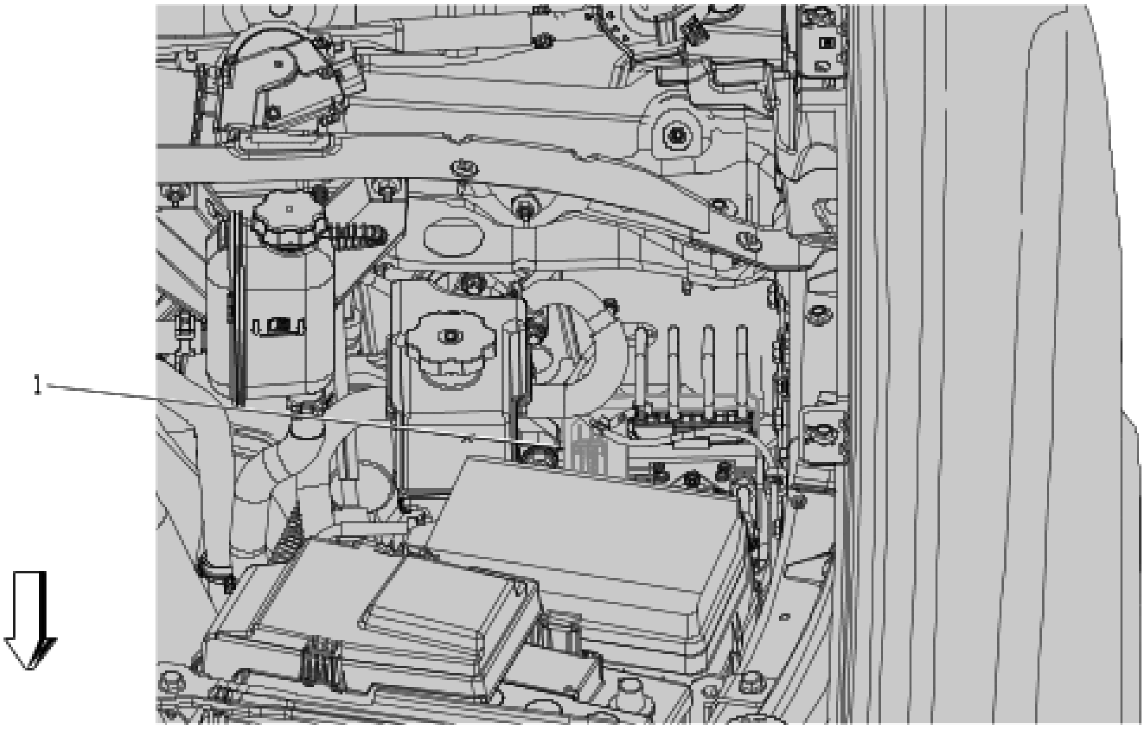
Engine Compartment Components - Top 2 of 2



6215763

Items
(1) X50A Engine Wiring Harness Junction Block
(2) K71 Transmission Control Module
(3) G73 Low Temperature Loop Coolant Pump (L5P)
(4) B75 Mass Airflow Sensor
(5) B36 Engine Oil Temperature Sensor (L8T)

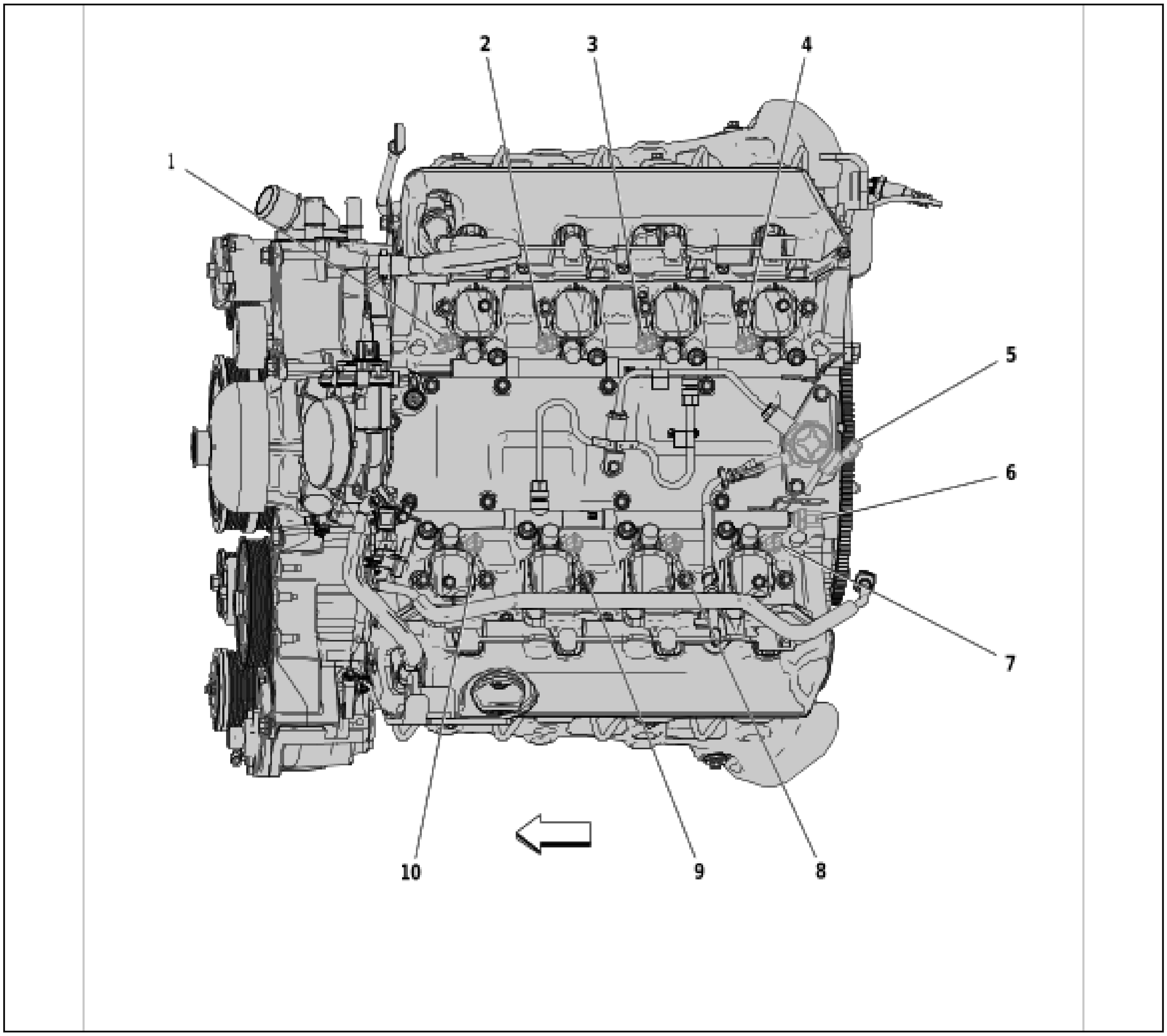
Engine Compartment Components - Left Rear



6298333

Items
(1) K17 Electronic Brake Control Module

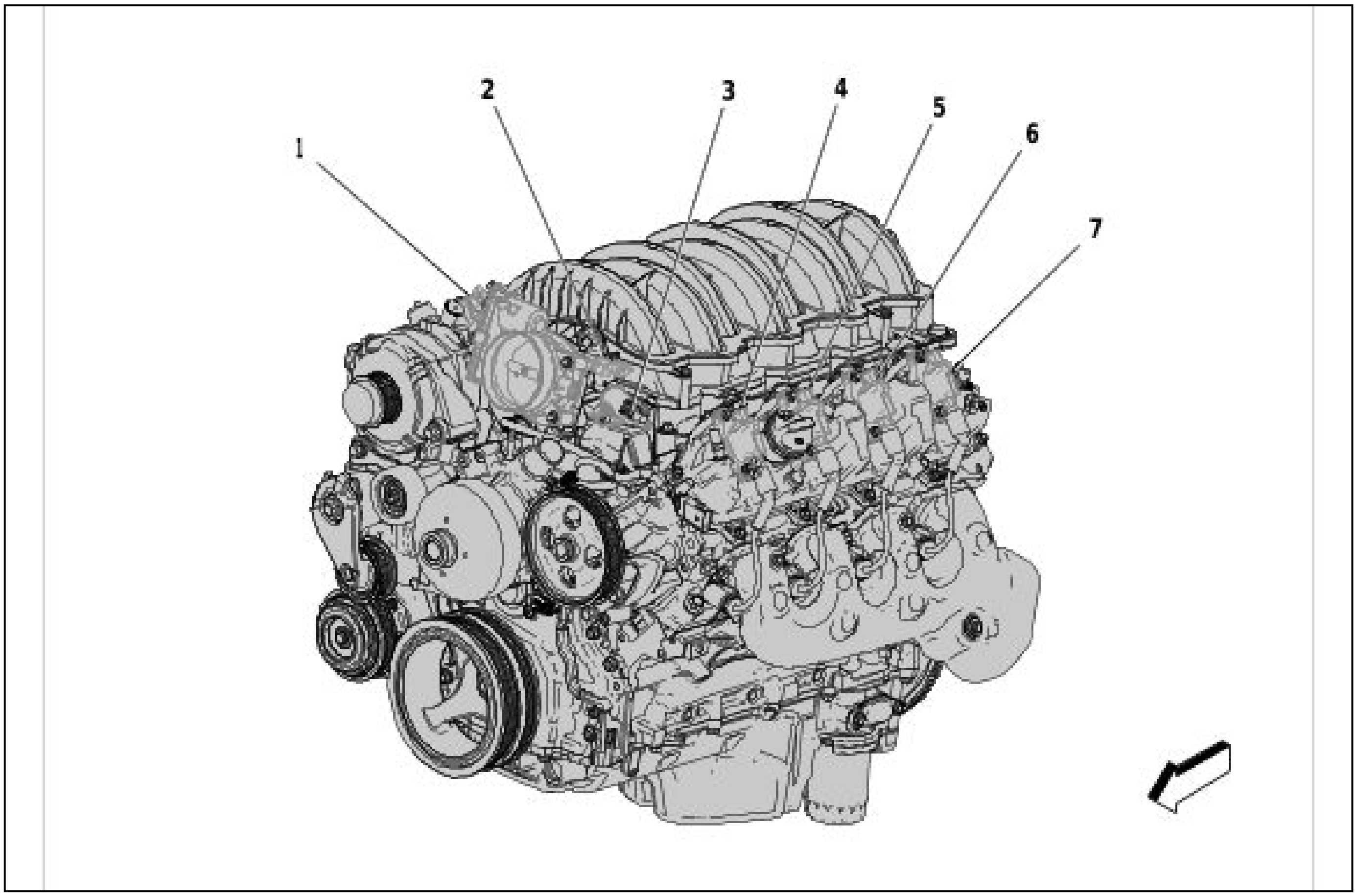
Engine Components - Top (L8T)



6400187

Items
(1) Q17B Fuel Injector 2
(2) Q17D Fuel Injector 4
(3) Q17F Fuel Injector 6
(4) Q17H Fuel Injector 8
(5) G18 Fuel Pump - High Pressure
(6) B310 Fuel Pressure and Temperature Sensor (L8T)
(7) Q17G Fuel Injector 7
(8) Q17E Fuel Injector 5
(9) Q17C Fuel Injector 3
(10) Q17A Fuel Injector 1

Engine Components - Left Front (L8T)



6215765

Items

(1) Q38 Throttle Body

(2) B74 Manifold Absolute Pressure Sensor

(3) Q12 Evaporative Emission Canister Purge Solenoid Valve (L8T)

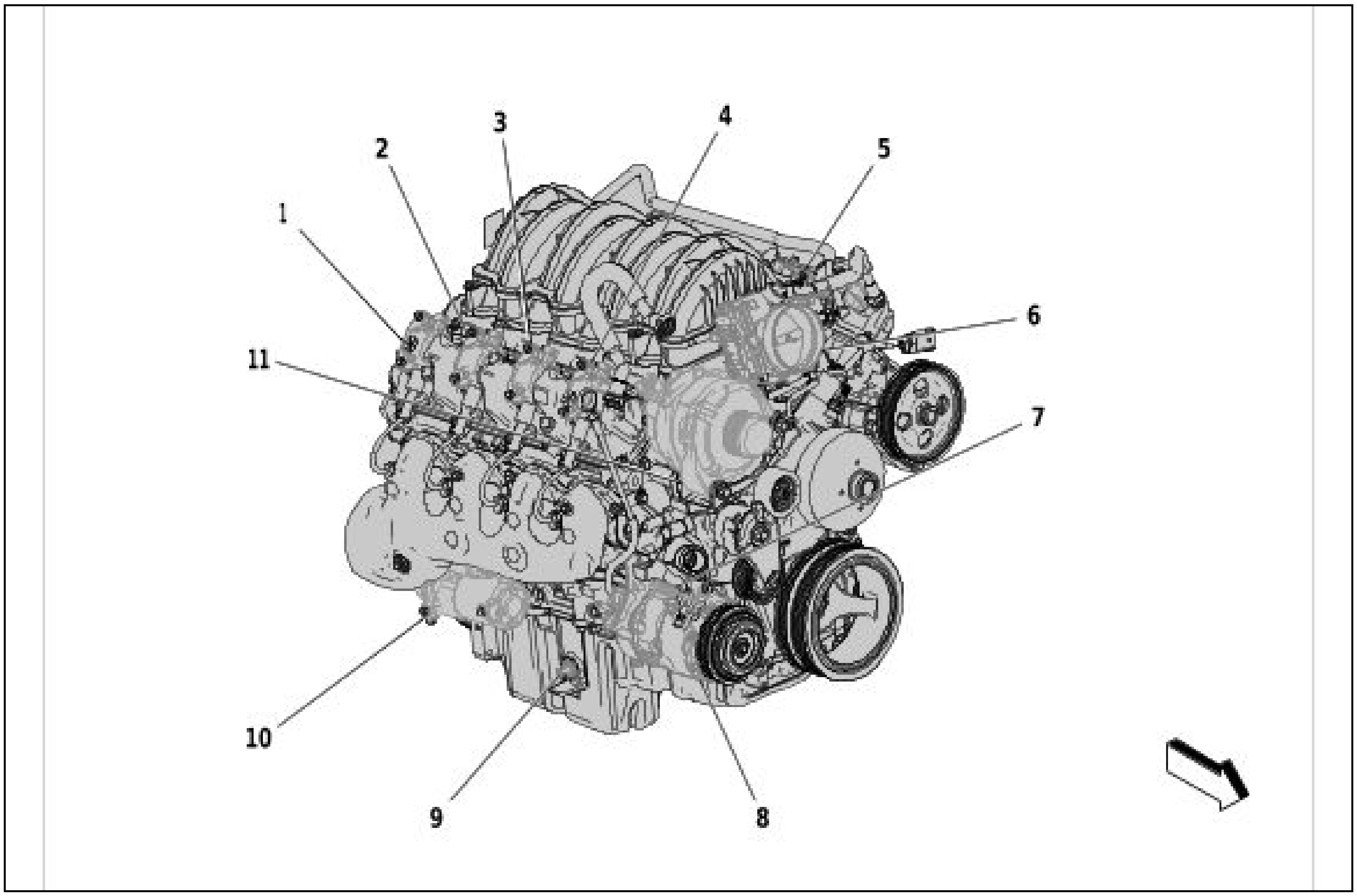
(4) T8A Ignition Coil 1 (L8T)

(5) T8C Ignition Coil 3 (L8T)

(6) T8E Ignition Coil 5 (L8T)

(7) T8G Ignition Coil 7 (L8T)

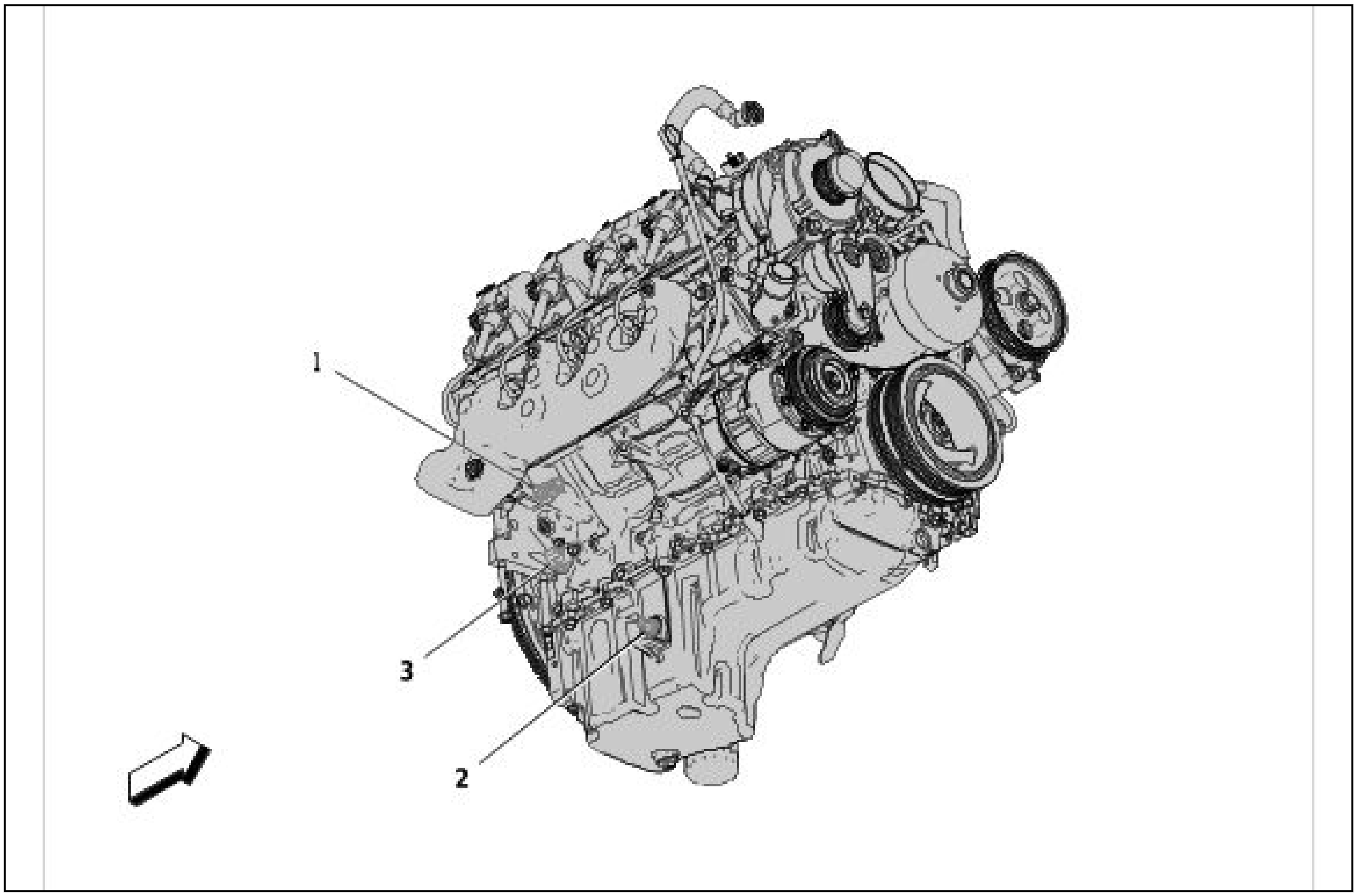
Engine Components - Right Front (L8T)



6215766

Items
(1) T8H Ignition Coil 8 (L8T)
(2) T8F Ignition Coil 6 (L8T)
(3) T8D Ignition Coil 4 (L8T)
(4) T8B Ignition Coil 2 (L8T)
(5) B74 Manifold Absolute Pressure Sensor
(6) Q38 Throttle Body
(7) Q2 Air Conditioning Clutch
(8) Q46 Air Conditioning Compressor Solenoid Valve
(9) B35 Engine Oil Level Indicator Switch (L8T)
(10) M64 Starter
(11) G13 Generator

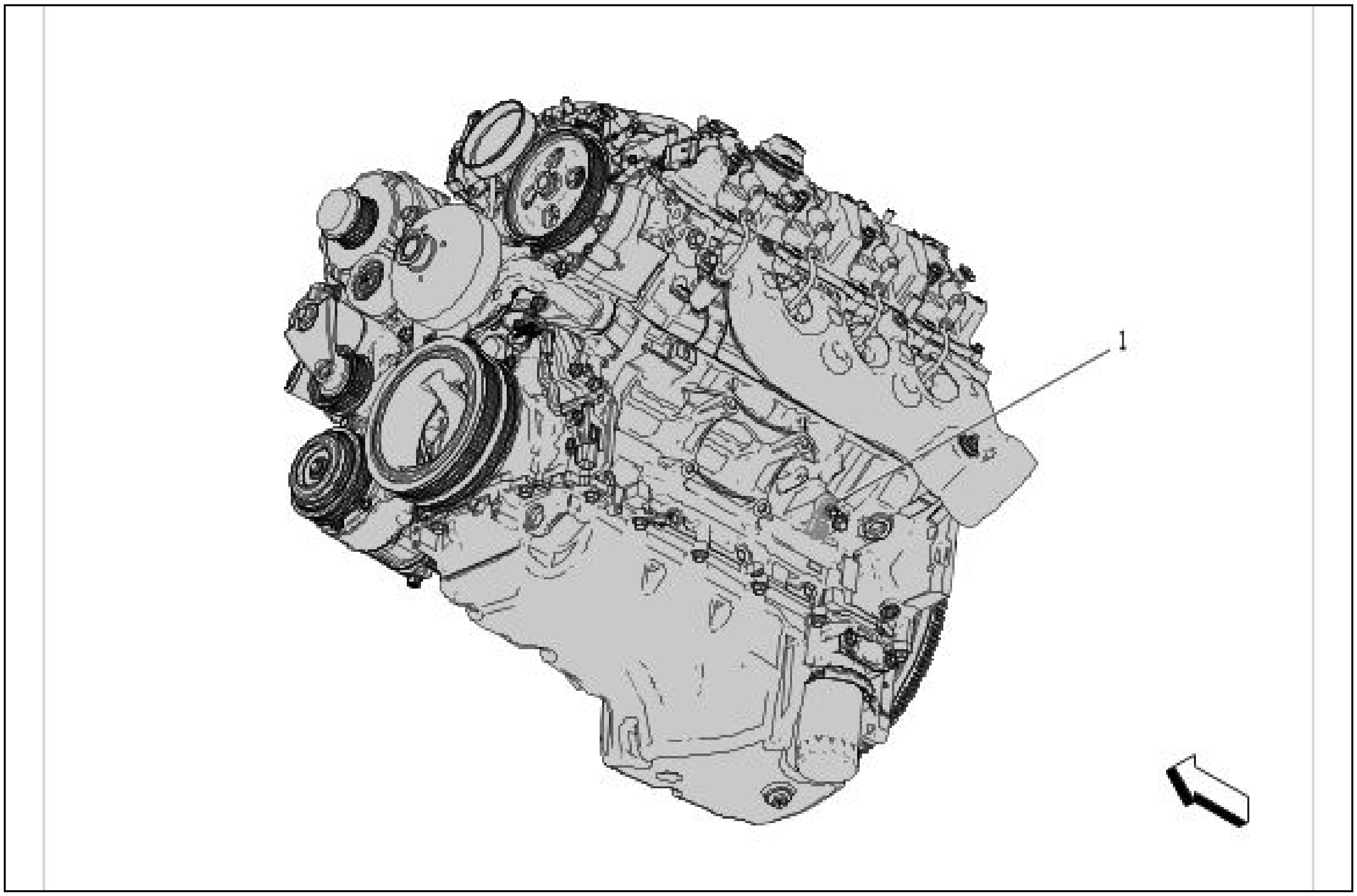
Engine Components - Right Rear (L8T)



6215767

Items
(1) B68B Knock Sensor 2 (L8T)
(2) B35 Engine Oil Level Indicator Switch (L8T)
(3) B26 Crankshaft Position Sensor

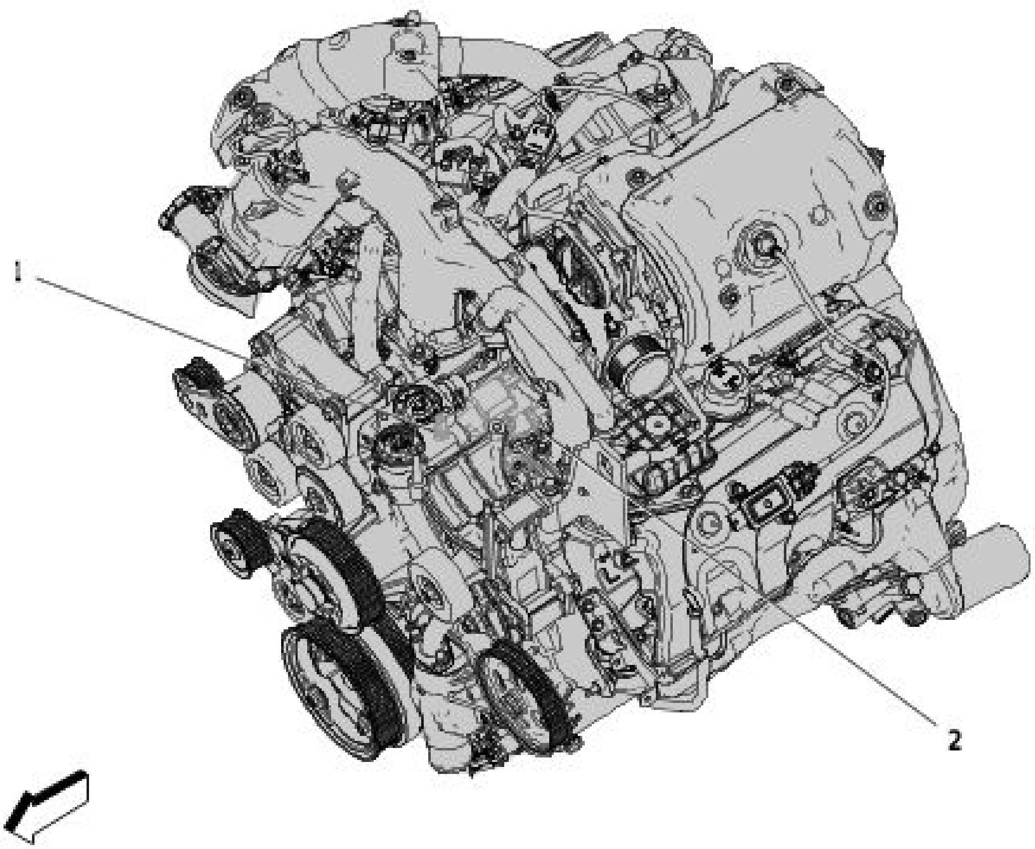
Engine Components - Left Rear (L8T)



6215768

Items
(1) B68A Knock Sensor 1 (L8T)

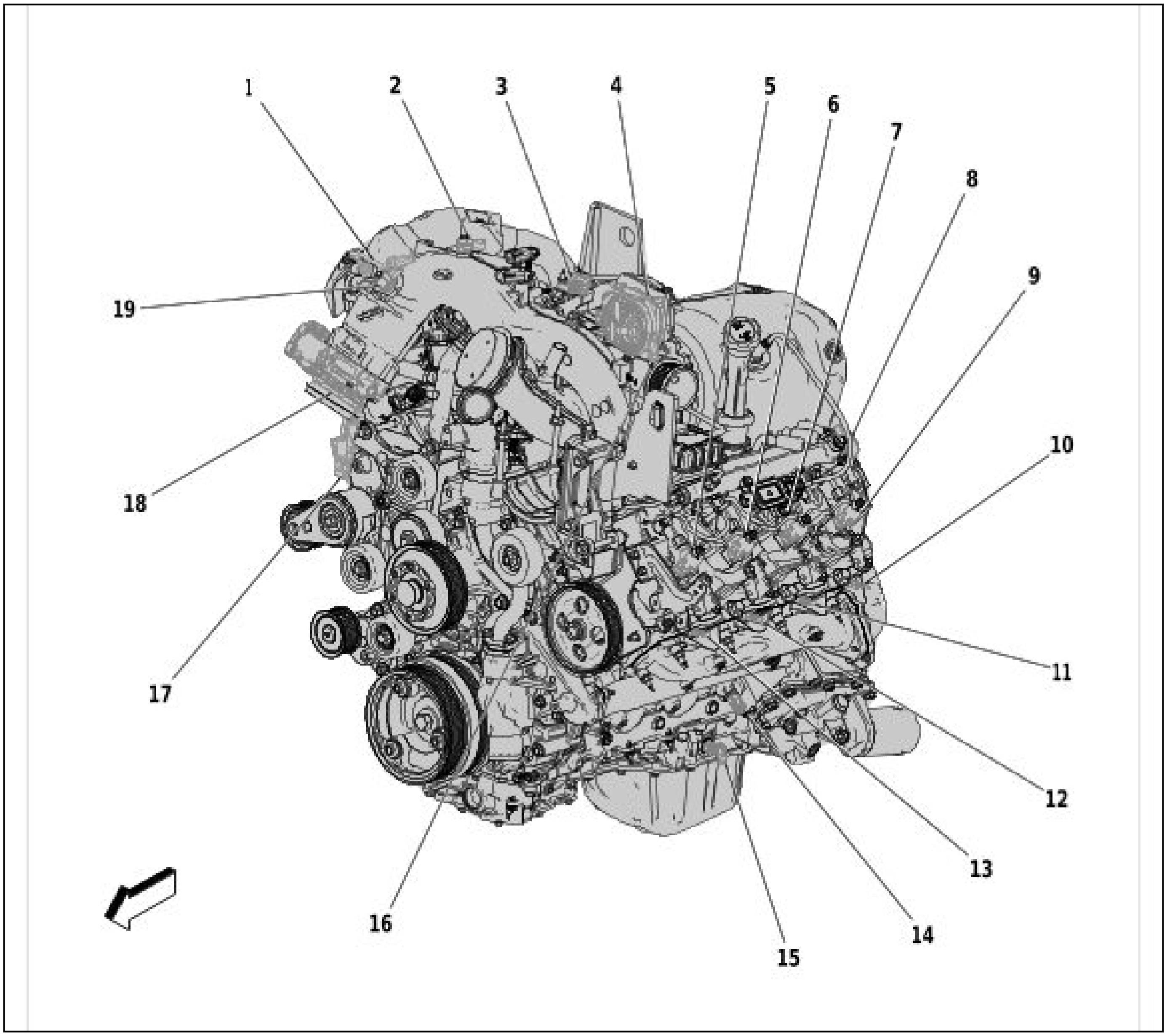
Engine Components - Top (L5P)



6215769

Items
(1) B34 Engine Coolant Temperature Sensor (L8T)
(2) Q18A Fuel Pressure Regulator 1 (L5P)

Engine Components - Left (L5P)

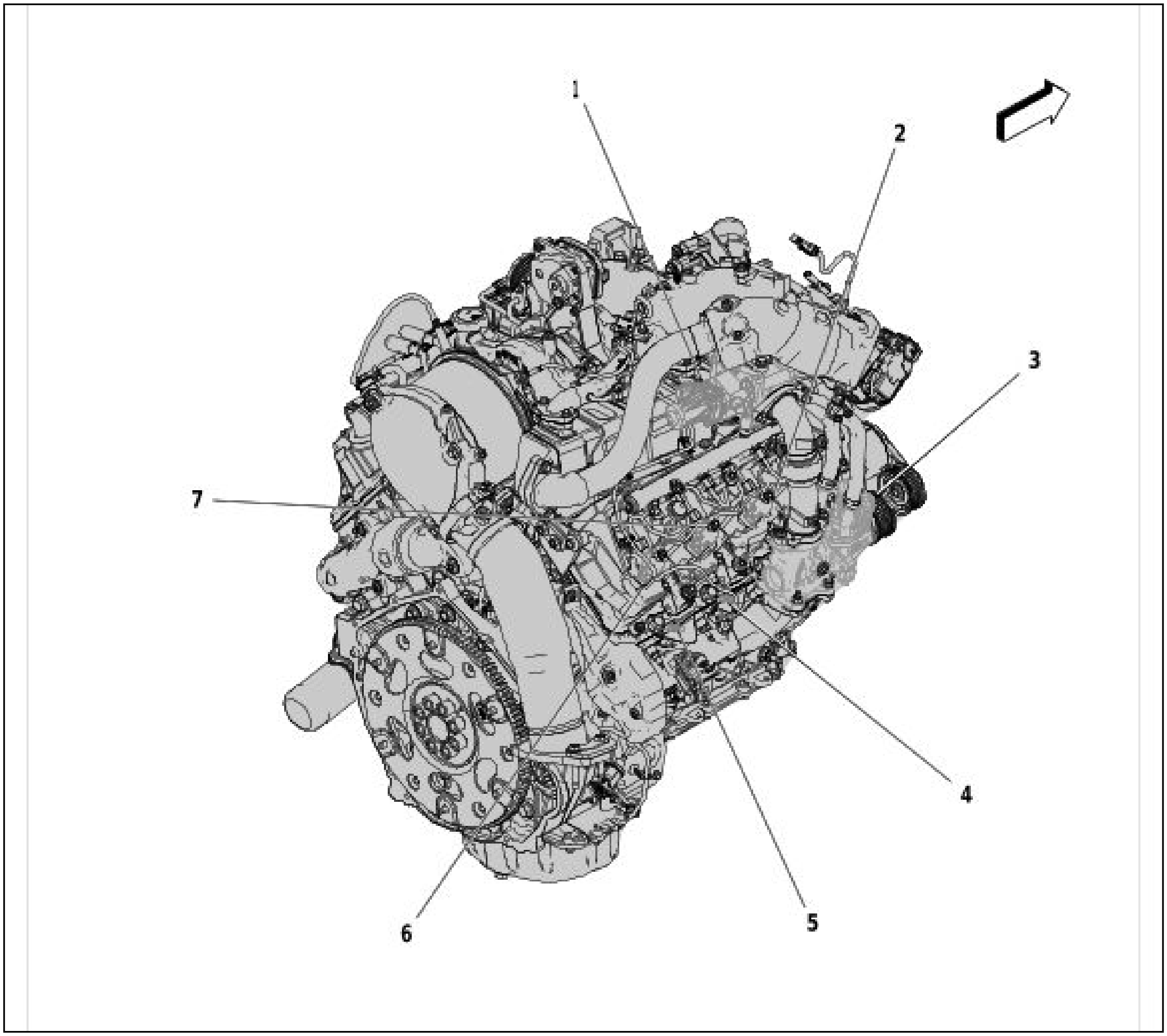


6215770

Items
(1) B130 Exhaust Gas Recirculation Temperature Sensor
(2) B66 Intake Air Temperature Sensor (L5P)
(3) B359 Exhaust Gas Temperature Sensor Module (L5P)
(4) M103 Turbocharger Vane Position Actuator (L5P)
(5) Q17B Fuel Injector 2
(6) Q17D Fuel Injector 4
(7) Q17F Fuel Injector 6
(8) Q18B Fuel Pressure Regulator 2 (L5P)
(9) Q17H Fuel Injector 8
(10) E12H Glow Plug 8 (L5P)
(11) E12F Glow Plug 6 (L5P)
(12) E12D Glow Plug 4 (L5P)

Items
(13) E12B Glow Plug 2 (L5P)
(14) B37B Engine Oil Pressure Sensor
(15) B35 Engine Oil Level Indicator Switch (L8T)
(16) B193A Charge Air Cooler Air Temperature Sensor - Inlet (L5P)
(17) Q14 Exhaust Gas Recirculation Valve (L5P)
(18) Q20 Intake Airflow Control Valve (L5P)
(19) B74 Manifold Absolute Pressure Sensor

Engine Components - Right Rear (L5P)

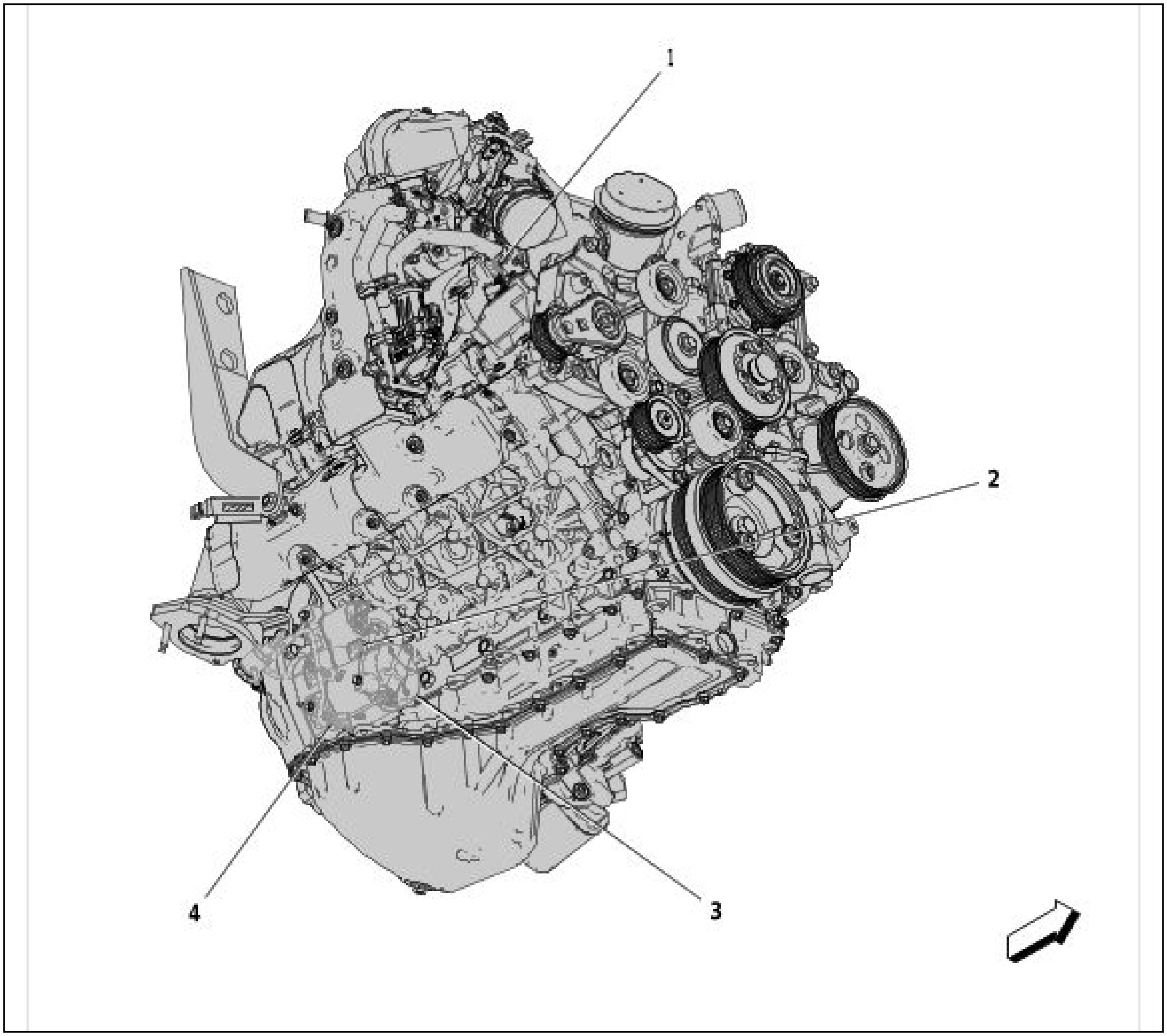


6215771

Items
(1) Q47 Exhaust Gas Recirculation Cooler Bypass Solenoid Valve
(2) Q17C Fuel Injector 3

Items
(2) Q17E Fuel Injector 5
(3) Q14 Exhaust Gas Recirculation Valve (L5P)
(4) E12E Glow Plug 5 (L5P)
(5) E12G Glow Plug 7 (L5P)
(6) Q17G Fuel Injector 7
(7) Q17E Fuel Injector 5

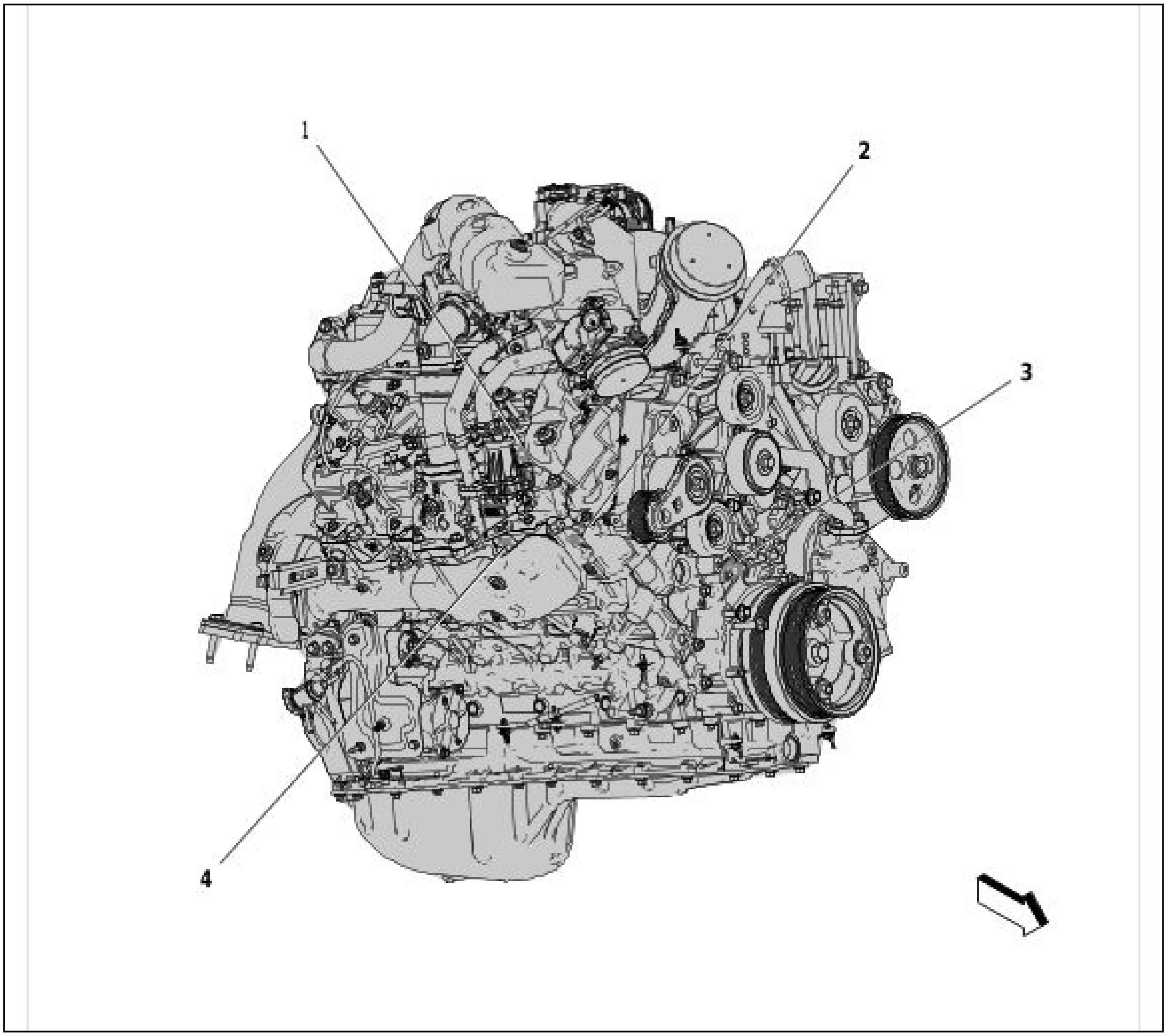
Engine Components - Right (L5P)



6215772

Items
(1) B47B Fuel Rail Pressure Sensor
(2) B26 Crankshaft Position Sensor
(3) M64 Starter
(4) Q61 Reductant Fluid Injector (L5P)

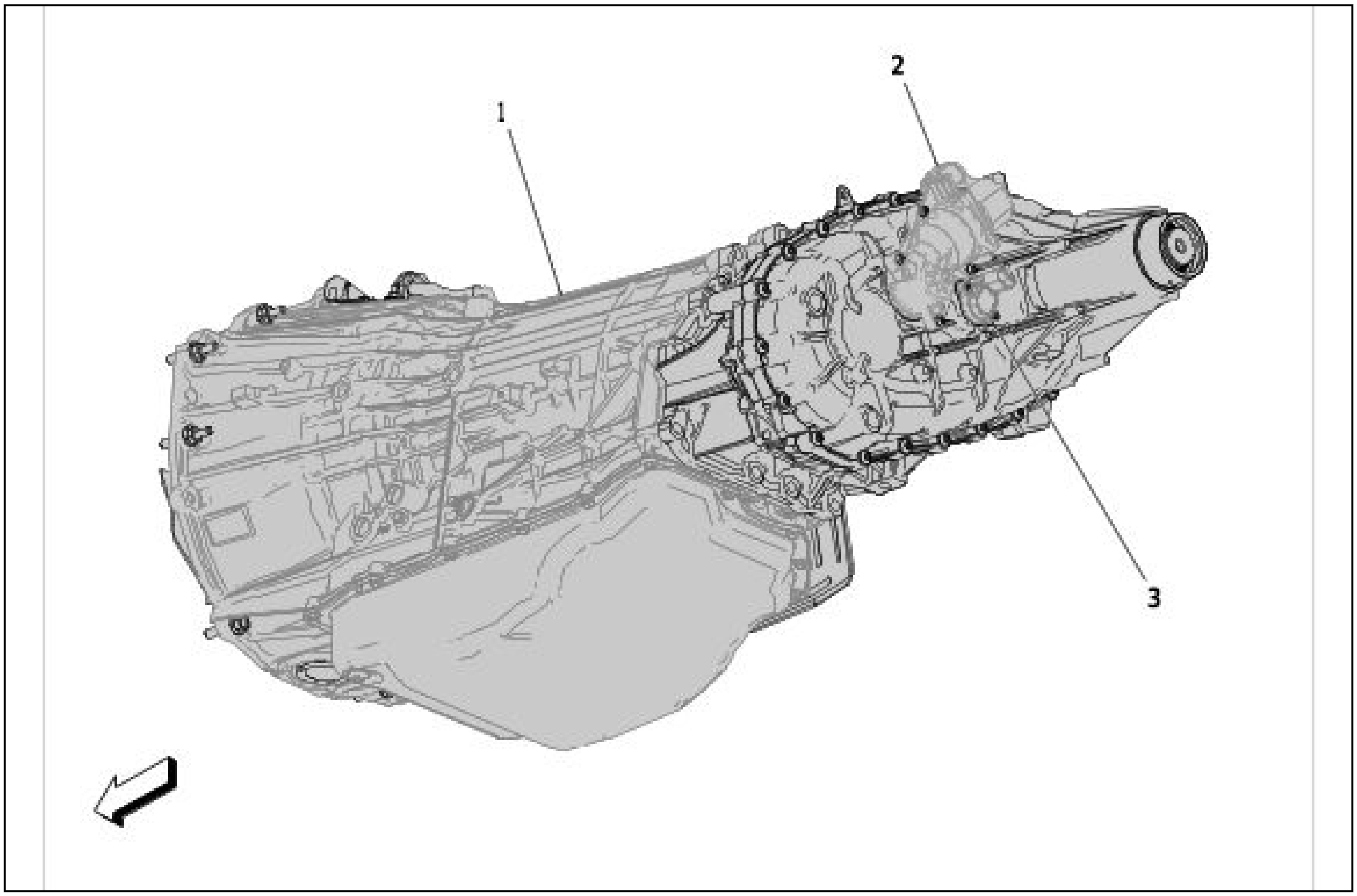
Engine Components - Right Front (L5P)



6215773

Items
(1) Q17A Fuel Injector 1
(2) E12A Glow Plug 1 (L5P)
(3) B23 Camshaft Position Sensor
(4) E12C Glow Plug 3 (L5P)

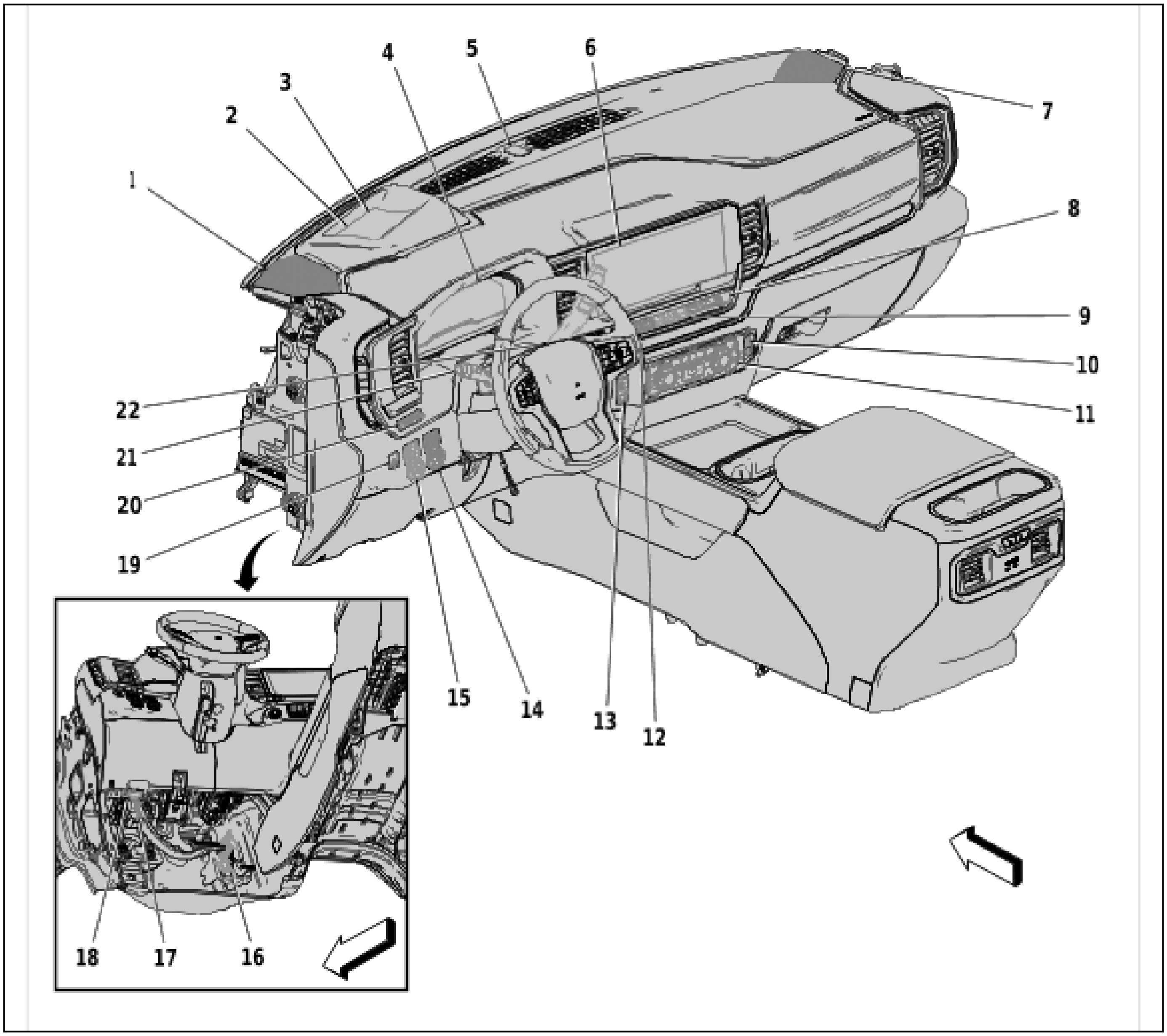
Transfer Case Components



6215779

Items
(1) T12 Automatic Transmission
(2) A16 Transfer Case Four Wheel Drive Actuator (NQF / NQH)
(3) B139 Transfer Case Two/Four Wheel Drive Actuator Position Sensor (NQF / NQH)

Instrument Panel - Front

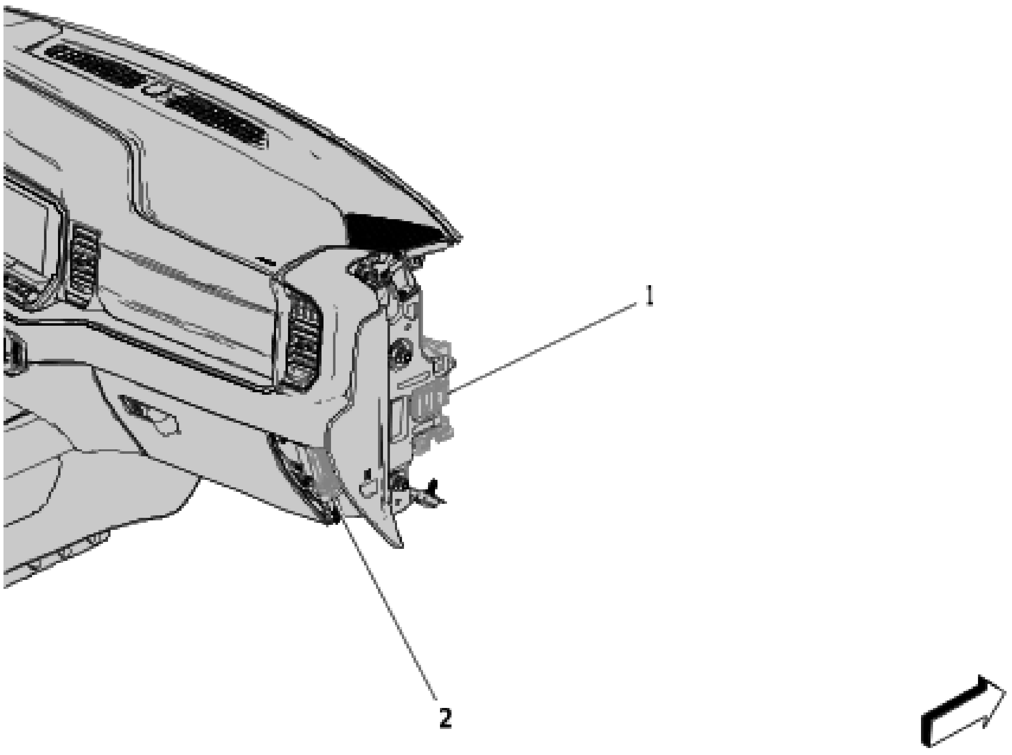


6215780

Items
(1) P19J Radio Front Speaker - Instrument Panel Left
(2) P43 Forward Collision Alert Display ((UHX / UEU) - UV6)
(3) P29 Head-Up Display (UV6)
(4) P16 Instrument Panel Cluster Control Module
(5) B10D Sun Load and Ambient Light and Security Indicator Sensor
(6) A22 Radio Control (IOK)
(7) P19W Radio Front Speaker - Instrument Panel Right
(8) S171R Instrument Panel Center Accessory Function Switch - Right
(9) S86 Vehicle Stability Control System Switch
(10) X92IP USB 2 Port Receptacle - Instrument Panel

Items
(11) A26 Heater and Air Conditioning User Interface Control - Front
(12) S171L Instrument Panel Center Accessory Function Switch - Left
(13) S76 Trailer Brake Control Switch
(14) S30 Headlamp Switch
(15) S126 Ride Control Switch (URC)
(16) B107 Accelerator Pedal Position Sensor
(17) B22 Brake Pedal Position Sensor
(18) X84 Data Link Connector
(19) S91 Parking Brake Control Switch
(20) S27 Head-Up Display Switch (UV6)
(21) S78 Turn Signal Switch
(22) S3C Automatic Transmission Control Lever (MHT / MQB / MQE)

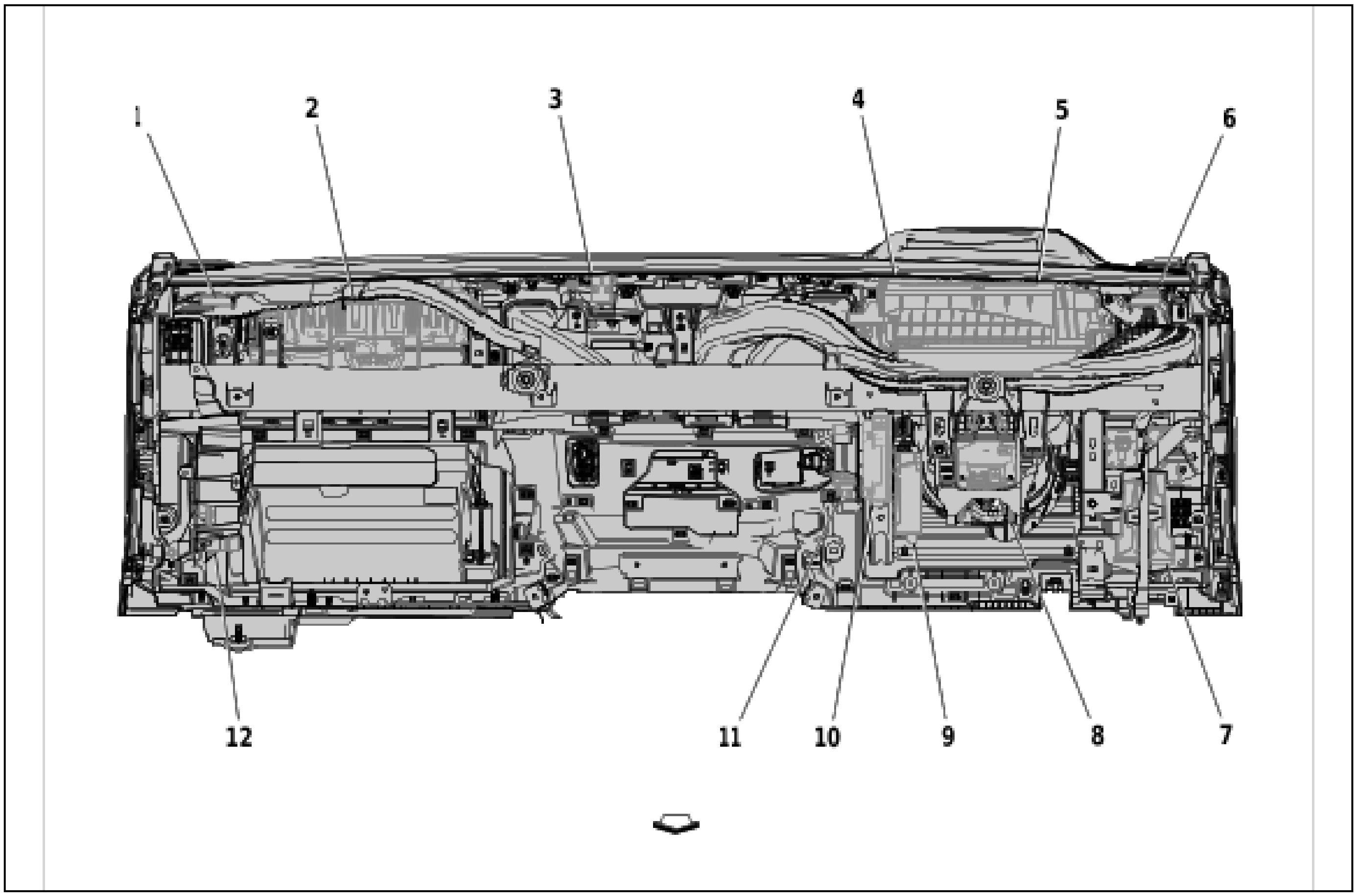
Instrument Panel - Right



6215781

Items
(1) A11 Radio
(2) X51R Instrument Panel Wiring Harness Junction Block - Right

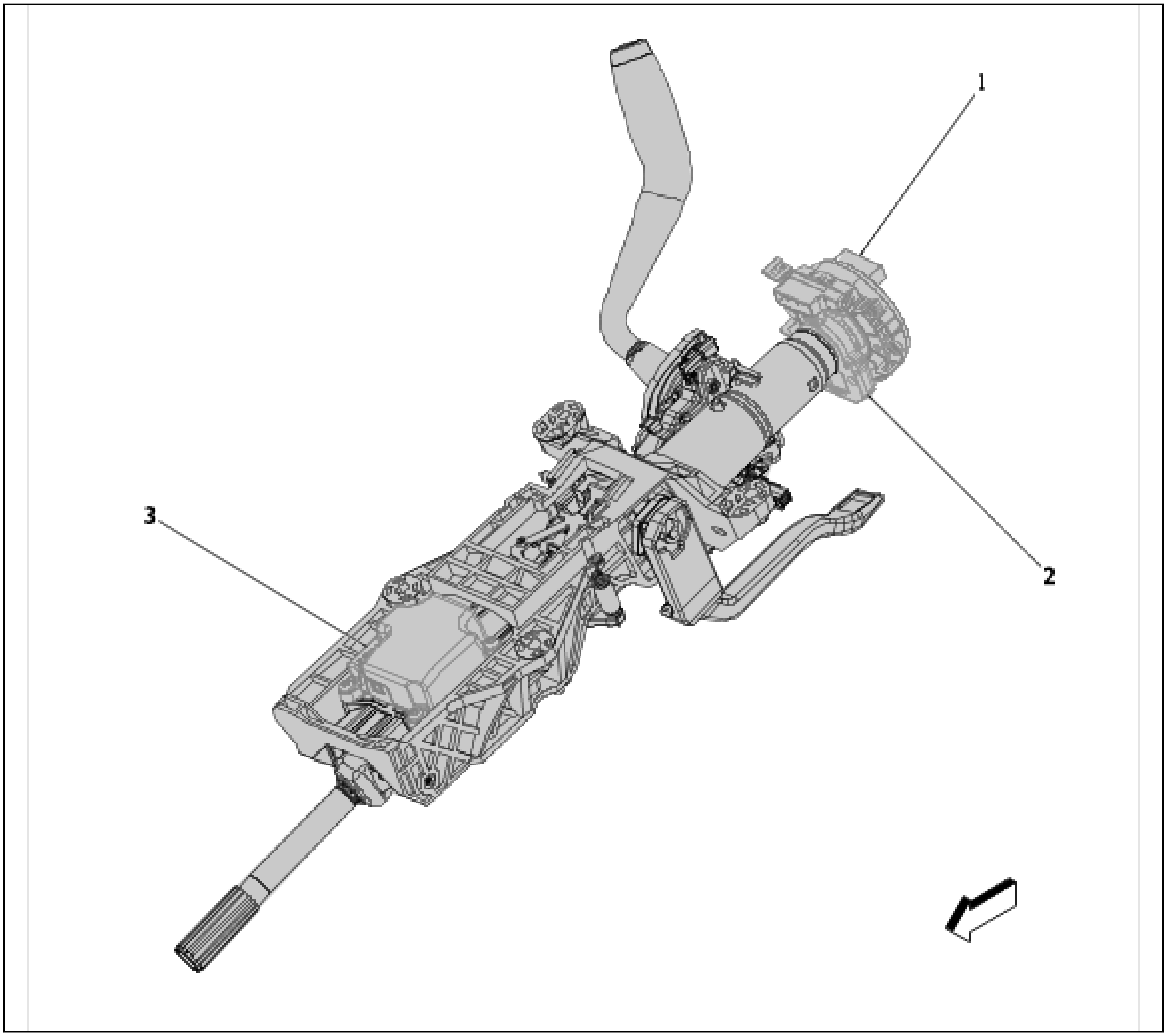
Instrument Panel - Rear



6215782

Items
(1) P19W Radio Front Speaker - Instrument Panel Right
(2) F101 Instrument Panel Airbag
(3) T4TA Auxiliary Wireless Communication Interface Antenna
(4) P29 Head-Up Display (UV6)
(5) P43 Forward Collision Alert Display ((UHX / UEU) - UV6)
(6) P19J Radio Front Speaker - Instrument Panel Left
(7) K9 Body Control Module
(8) K60 Column Lock Module (BTM)
(9) K73 Telematic Control Module (UE1)
(10) K56 Serial Data Gateway Module
(11) K56U Special Purpose Vehicle Control Module (KGU)
(12) A11 Radio

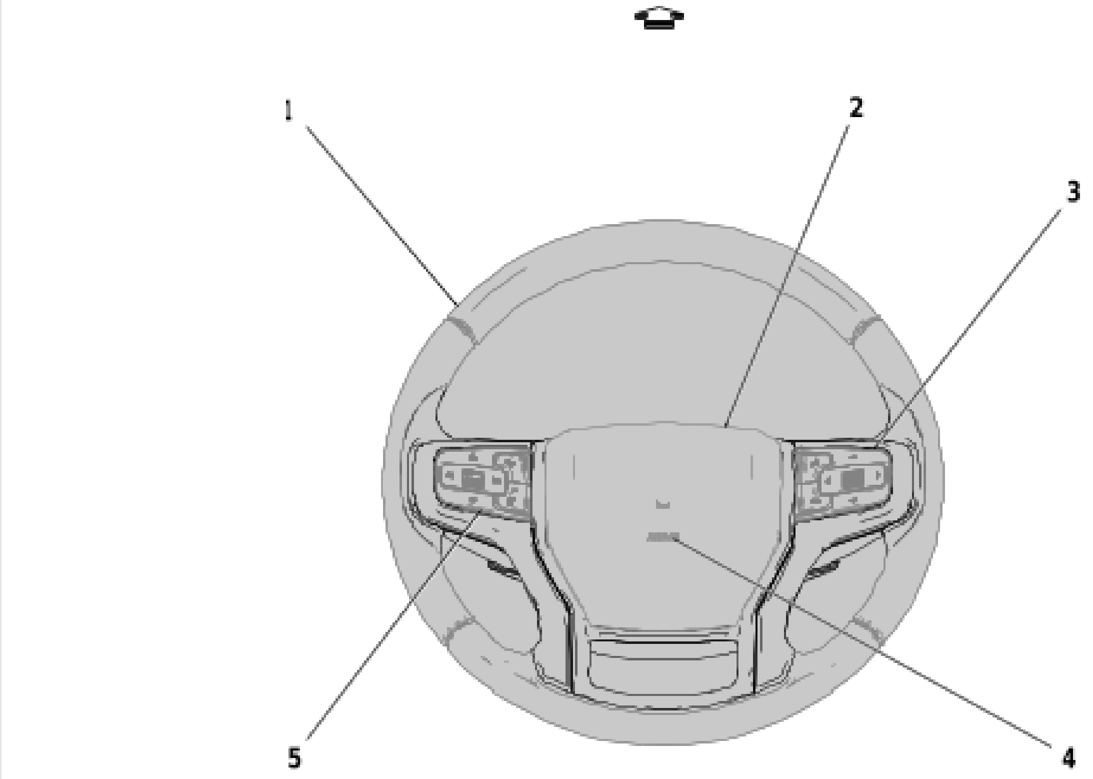
Steering Column Components



6298331

Items
(1) X85 Steering Wheel Airbag Coil
(2) B99 Steering Angle Sensor Module
(3) K60 Column Lock Module (BTM)

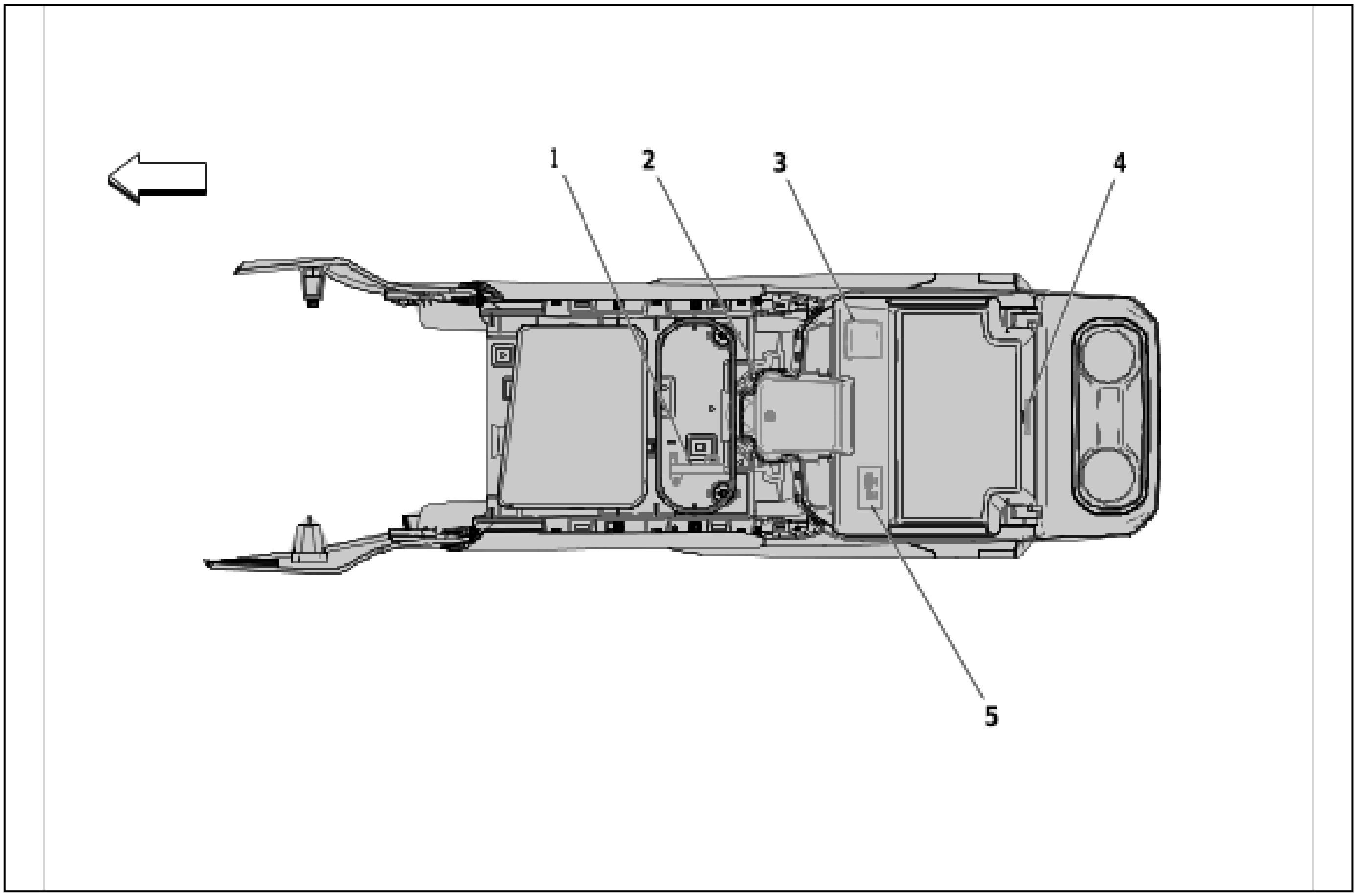
Steering Wheel Components



6215784

Items
(1) K32 Heated Steering Wheel Module (KI3)
(2) S33 Steering Wheel Horn Contact
(3) S70R Radio Control Switch - Steering Wheel
(4) F107 Steering Wheel Airbag
(5) S70L Cruise Control Switch

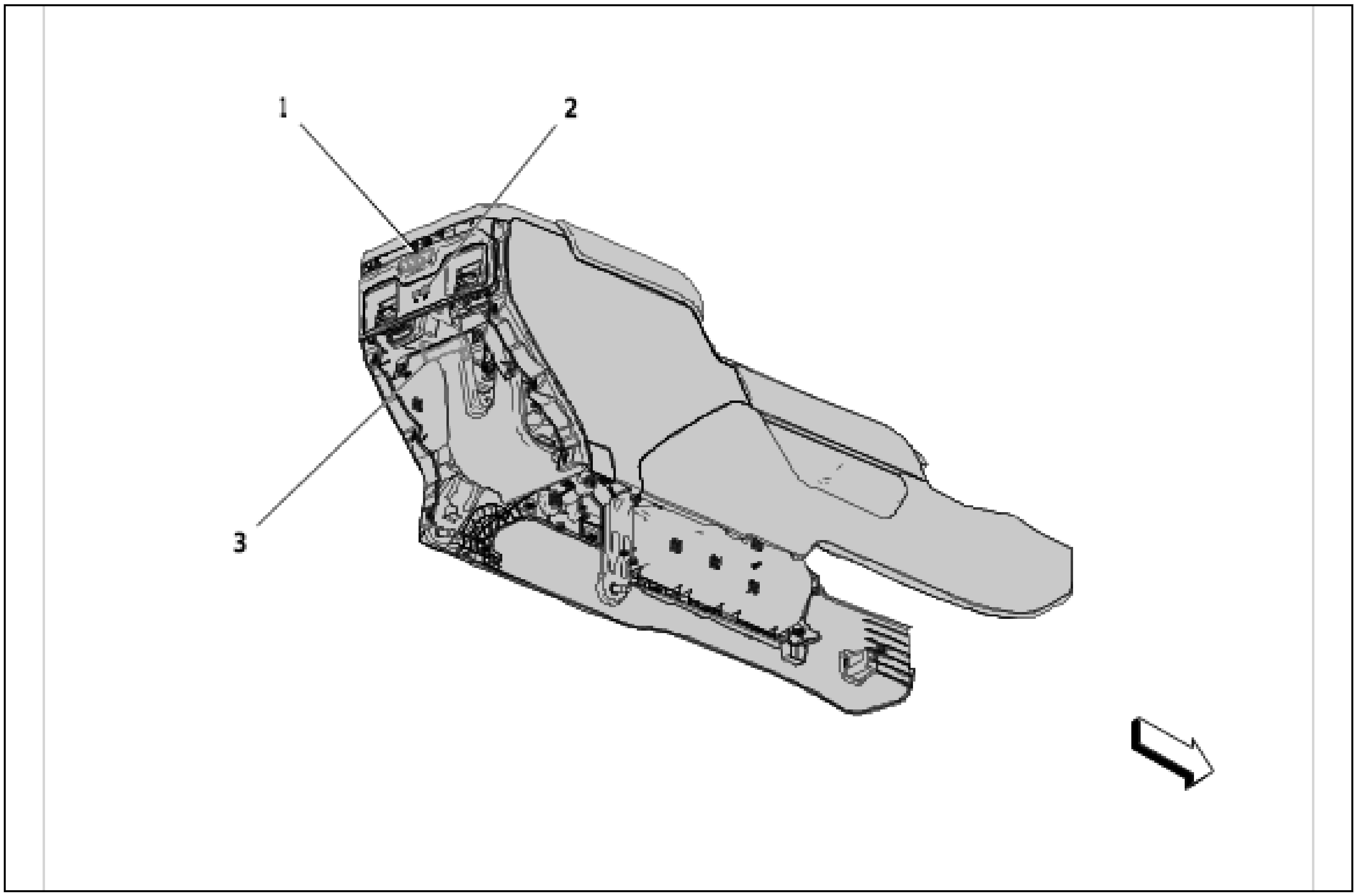
Floor Console Components 1 of 2



6215786

Items
(1) T10UA Low Frequency Console Antenna
(2) T22 Wireless Accessory Charging Module (K4C)
(3) X81ACA Front Floor Console Accessory Power Rear Receptacle - 110V AC (KI4 and D07)
(4) S32R Rear Seat Heater Switch (KA6)
(5) X83B Audio/Video Receptacle (UBC)

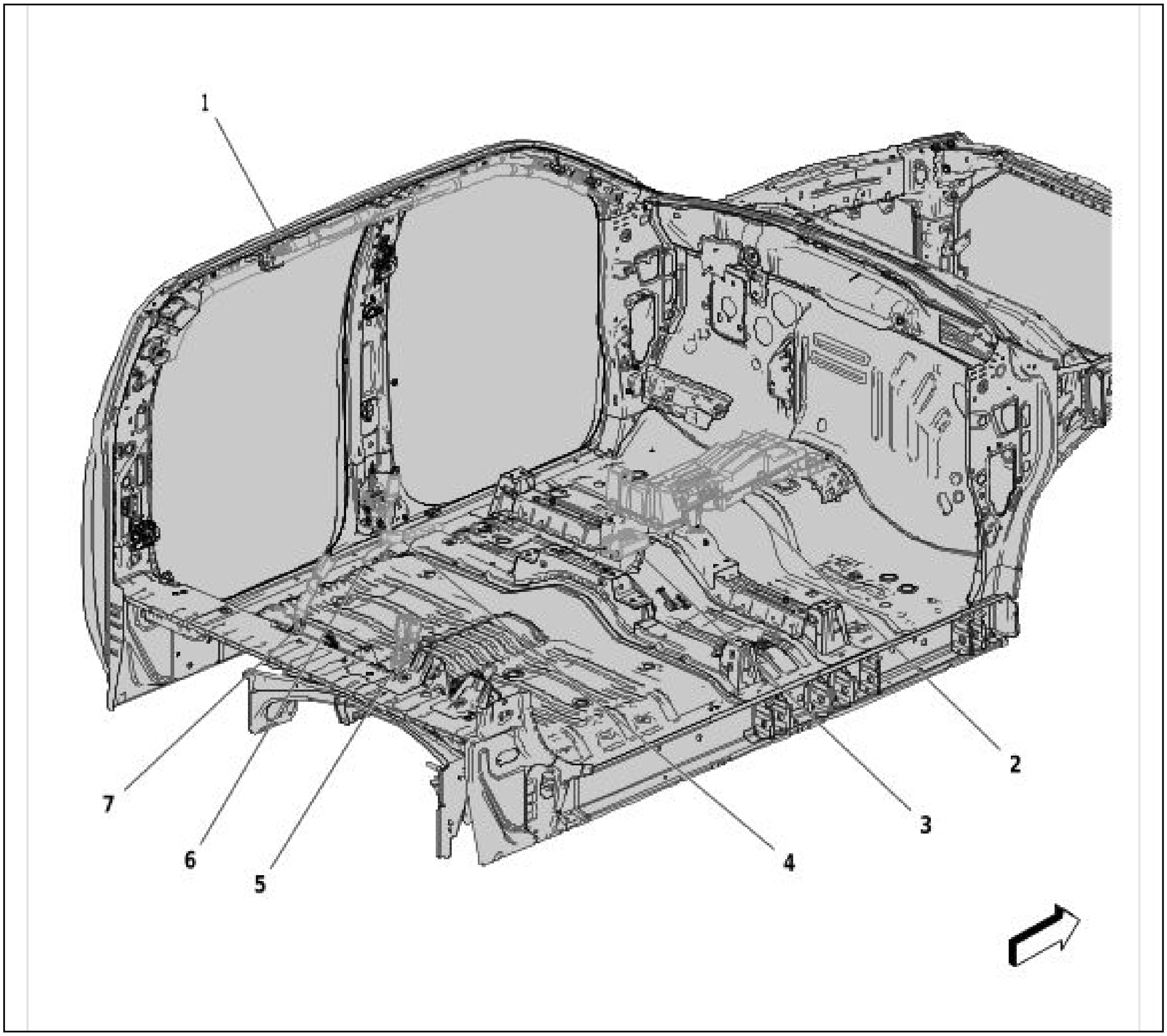
Floor Console Components 2 of 2



6215708

Items
(1) E28 Front Floor Console Compartment Lamp (D07)
(2) X92CD Dual Charge Only Receptacle - Floor Console Rear (D07 and UBI)
(3) T10KA Low Frequency Console Number 2 Antenna (D07)

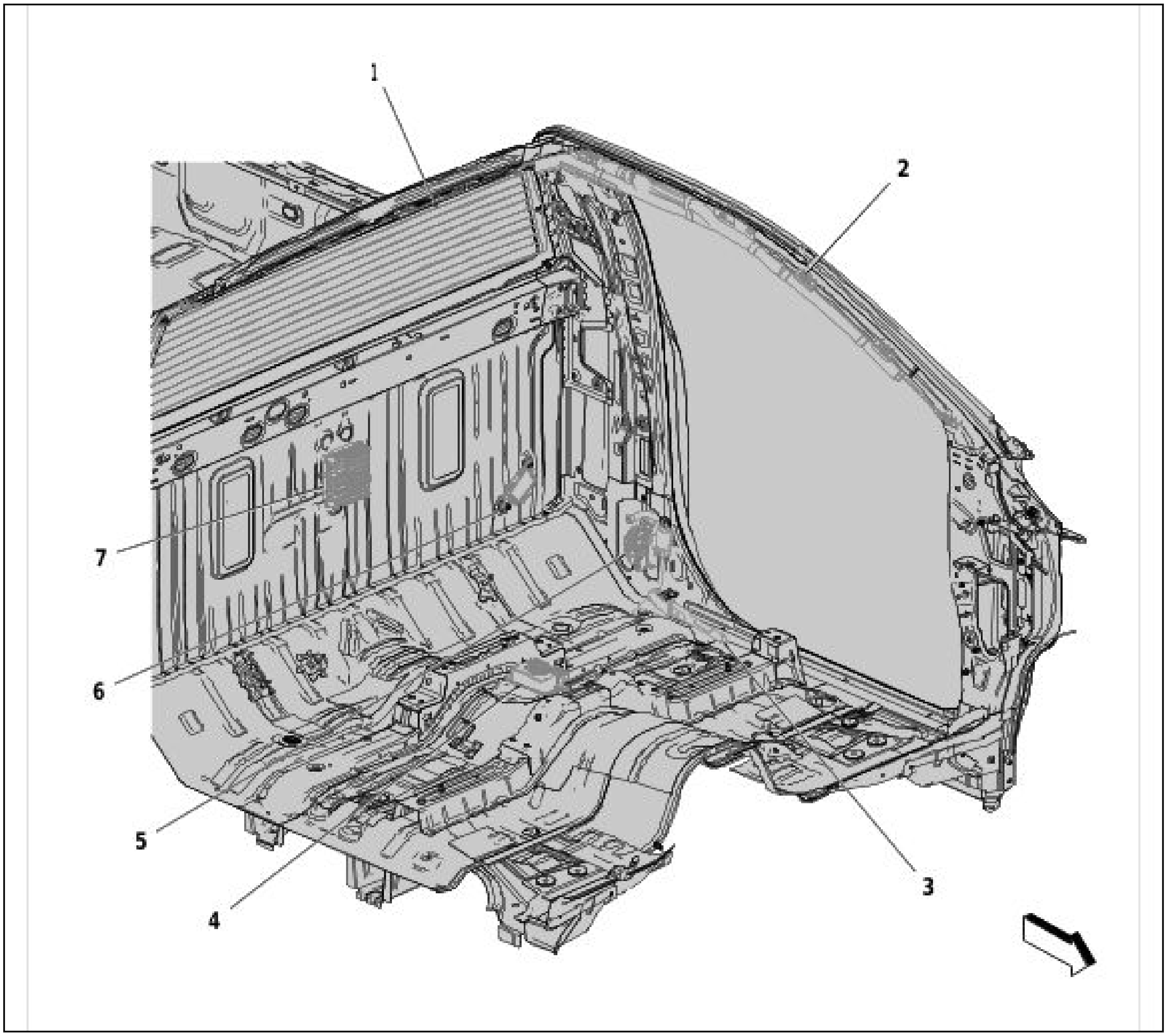
Passenger Compartment - Left Front - Double Cab/Crew Cab



6215788

Items
(1) F105L Front and Rear Row Roof Rail Airbag - Left (DOUBLE CAB / CREW CAB)
(2) P19AFC Front Floor Speaker - Console
(3) K36 Restraints Control Module
(4) F113D Front Seat Belt Anchor Plate Tensioner - Driver
(5) B153RR Rear Seat Belt Buckle - Right
(6) F112D Front Seat Belt Retractor - Driver
(7) B153LR Rear Seat Belt Buckle - Left

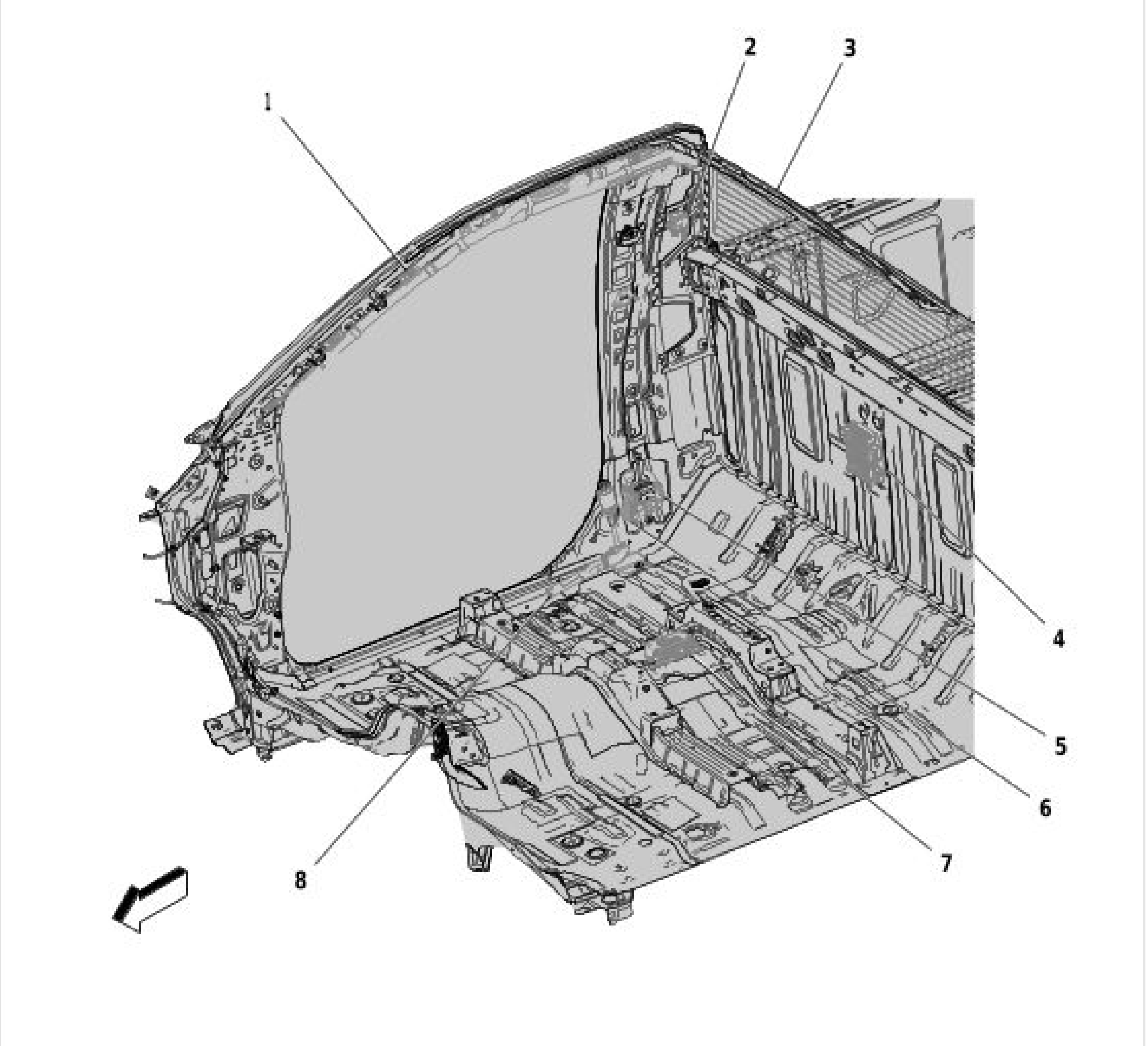
Passenger Compartment - Left Rear - Regular Cab



6215790

Items
(1) E18 Rear Window Defogger Grid
(2) F105LF Front Row Roof Rail Airbag - Left (REGULAR CAB)
(3) F113D Front Seat Belt Anchor Plate Tensioner - Driver
(4) K36 Restraints Control Module
(5) F112D Front Seat Belt Retractor - Driver
(6) K182 Parking Assist Control Module (UD5 / UD7)
(7) T1 DC/AC Converter Control Module (KI4 / KI5)

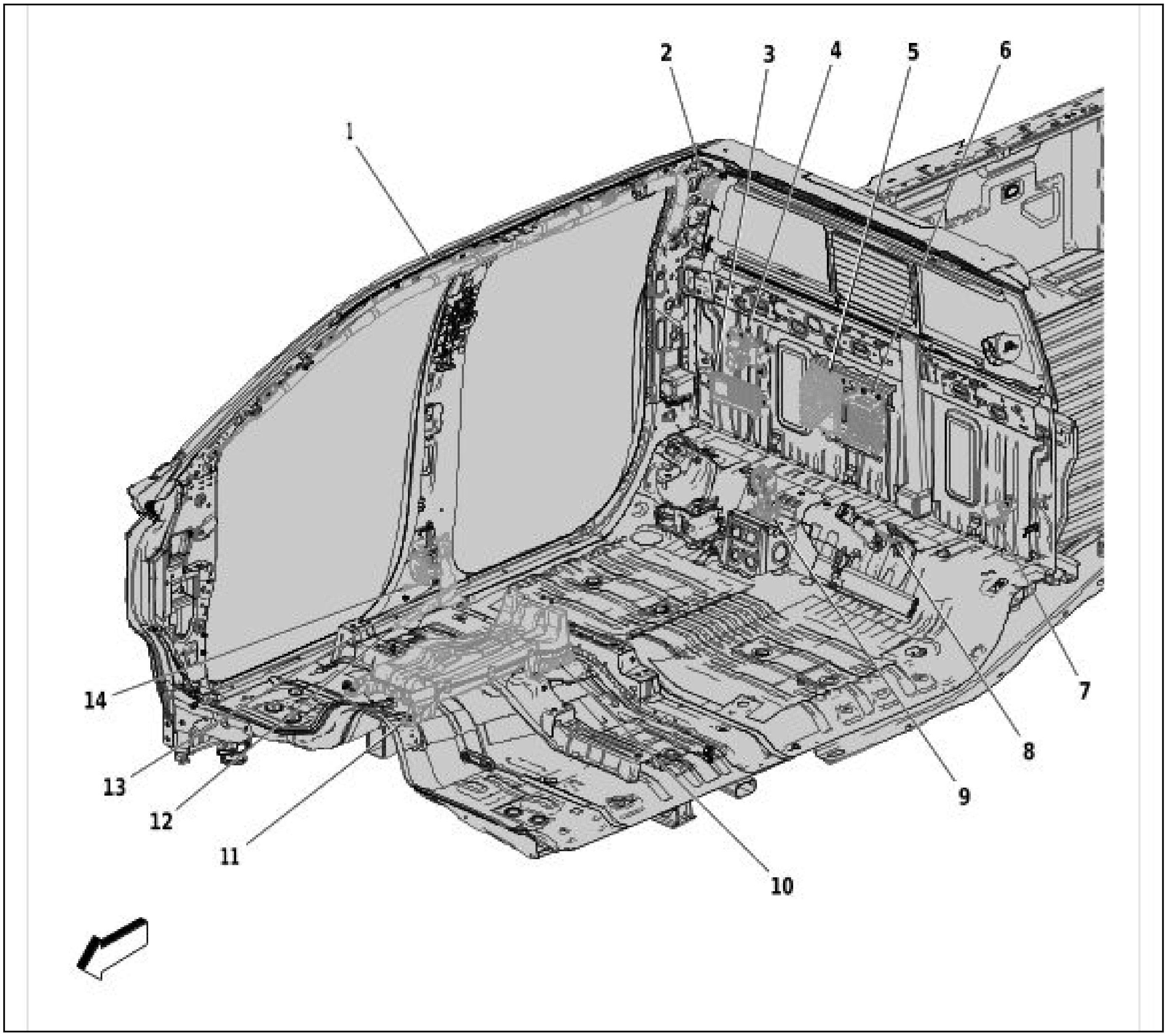
Passenger Compartment - Right Rear - Regular Cab



6215792

Items
(1) F105RF Front Row Roof Rail Airbag - Right (REGULAR CAB)
(2) K77 Remote Function Actuator Module
(3) E18 Rear Window Defogger Grid
(4) T1 DC/AC Converter Control Module (KI4 / KI5)
(5) F112P Front Seat Belt Retractor - Passenger
(6) B61P Seat Belt Tension Sensor - Passenger
(7) K36 Restraints Control Module
(8) F113P Front Seat Belt Anchor Plate Tensioner - Passenger

Passenger Compartment - Right Rear - Double Cab/Crew Cab

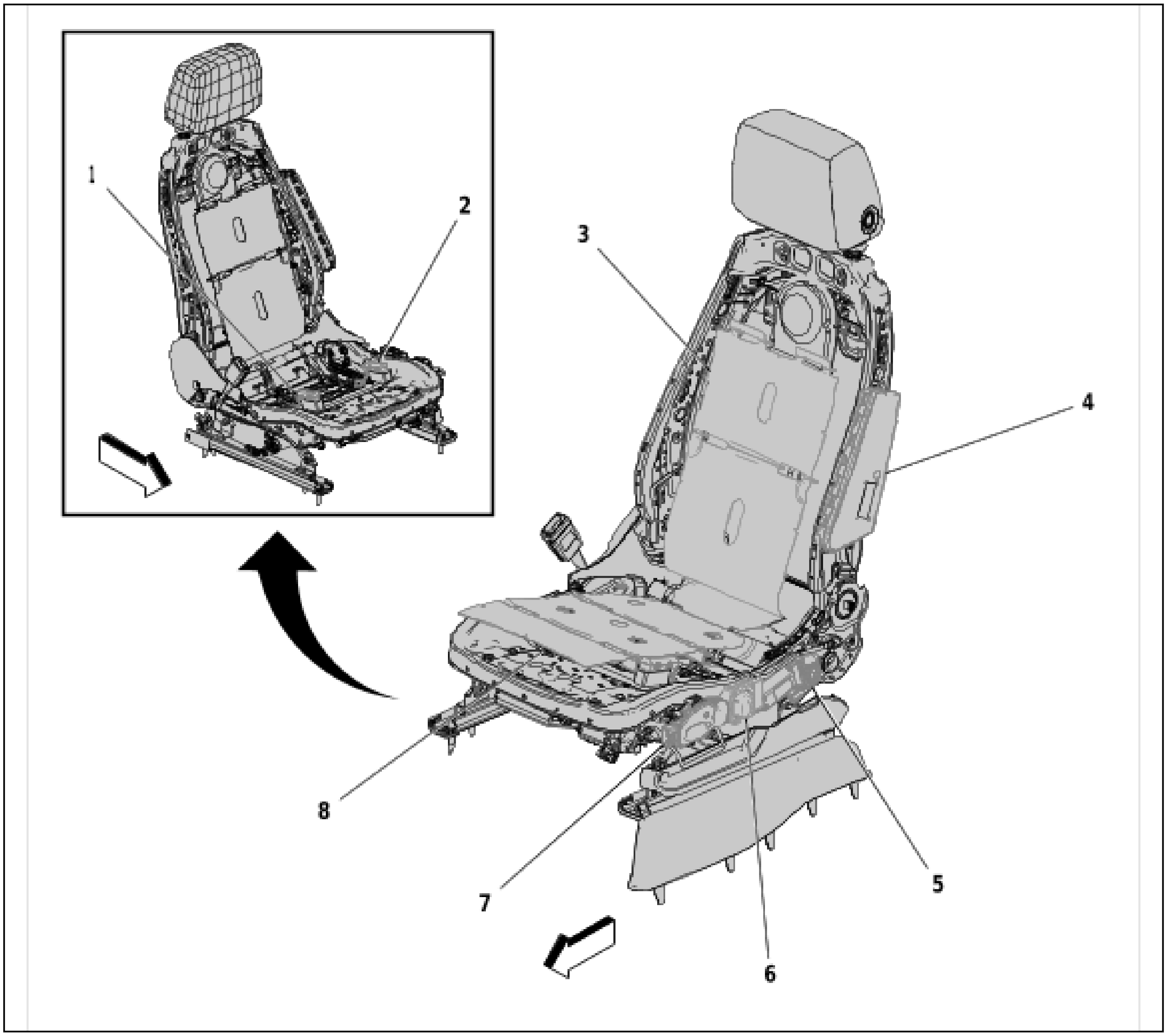


6215794

Items
(1) F105R Front and Rear Row Roof Rail Airbag - Right (DOUBLE CAB / CREW CAB)
(2) K77 Remote Function Actuator Module
(3) K157 Video Processing Module (UV2)
(4) M63 Rear Sliding Window Motor (A48)
(5) T3 Audio Amplifier (UQA)
(6) T1 DC/AC Converter Control Module (KI4 / KI5)
(7) K182 Parking Assist Control Module (UD5 / UD7)
(8) B153LR Rear Seat Belt Buckle - Left
(9) B153RR Rear Seat Belt Buckle - Right
(10) K36 Restraints Control Module
(11) P19AFC Front Floor Speaker - Console

Items
(12) F113P Front Seat Belt Anchor Plate Tensioner - Passenger
(13) F112P Front Seat Belt Retractor - Passenger
(14) B61P Seat Belt Tension Sensor - Passenger

Driver Seat Components 1 of 2

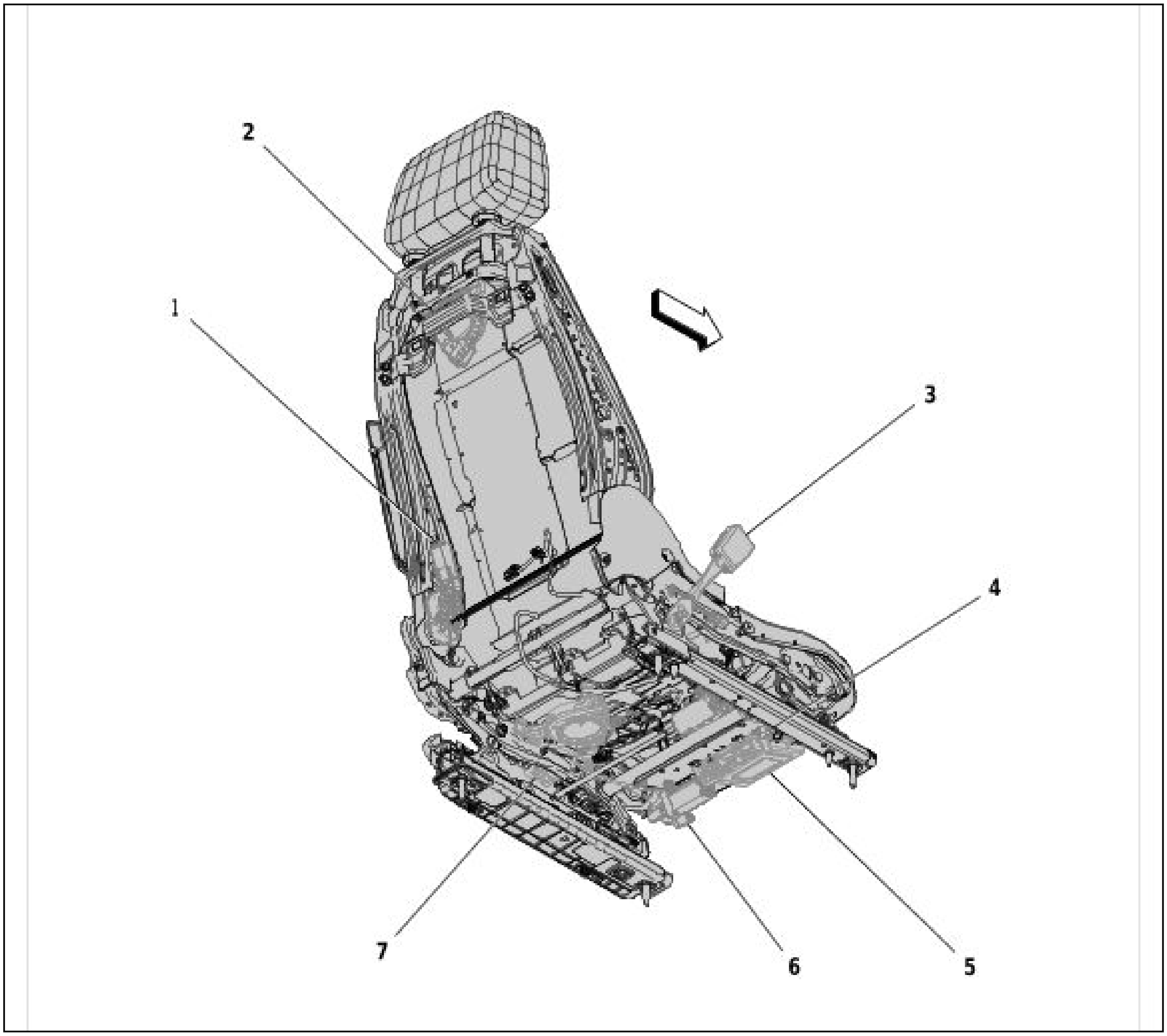


6396405

Items
(1) P45R Front Seat Lane Departure Warning Actuator - Right
(2) P45L Front Seat Lane Departure Warning Actuator - Left
(3) E14A Front Seat Back Heater - Driver (KA1 / KQV)
(4) F106D Front Seat Outboard Seat Back Airbag - Driver
(5) M55D Front Seat Vertical Adjuster Actuator - Driver
(6) S65D Front Seat Lumbar Switch - Driver (A2X)

Items
(7) S64D Front Seat Adjuster Switch - Driver
(8) E14B Front Seat Cushion Heater - Driver (KA1 / KQV)

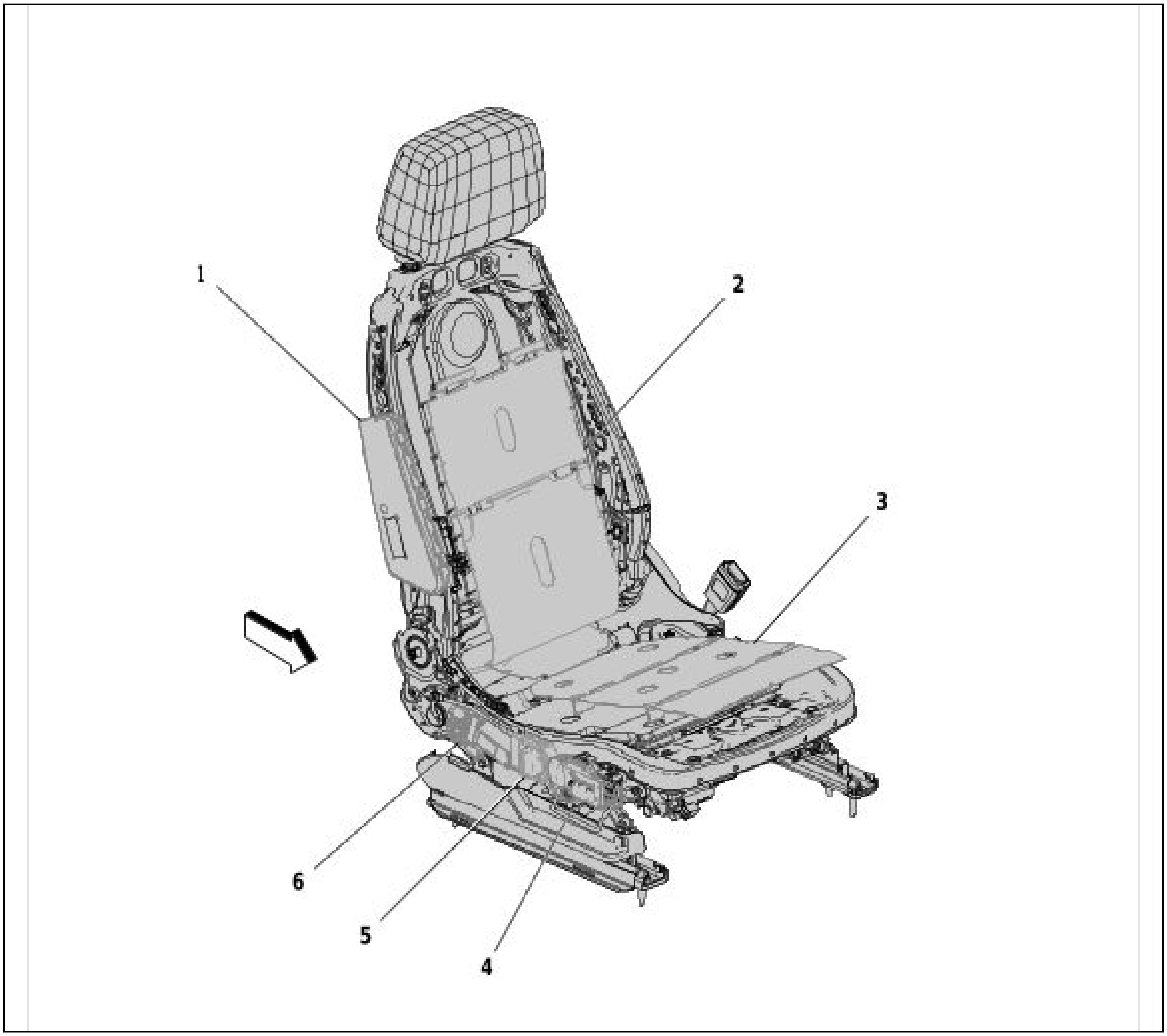
Driver Seat Components 2 of 2



6398207

Items
(1) M56D Front Seat Recliner Actuator - Driver
(2) M73A Front Seat Back Ventilation Blower - Driver (KQV)
(3) B153D Front Seat Belt Buckle - Driver
(4) M51D Front Seat Adjuster Actuator - Driver
(5) K40D Driver Seat Adjuster Memory Module (A45)
(6) M50D Front Seat Tilt Adjuster Actuator - Driver
(7) M73D Front Seat Cushion Ventilation Blower - Driver (KQV)

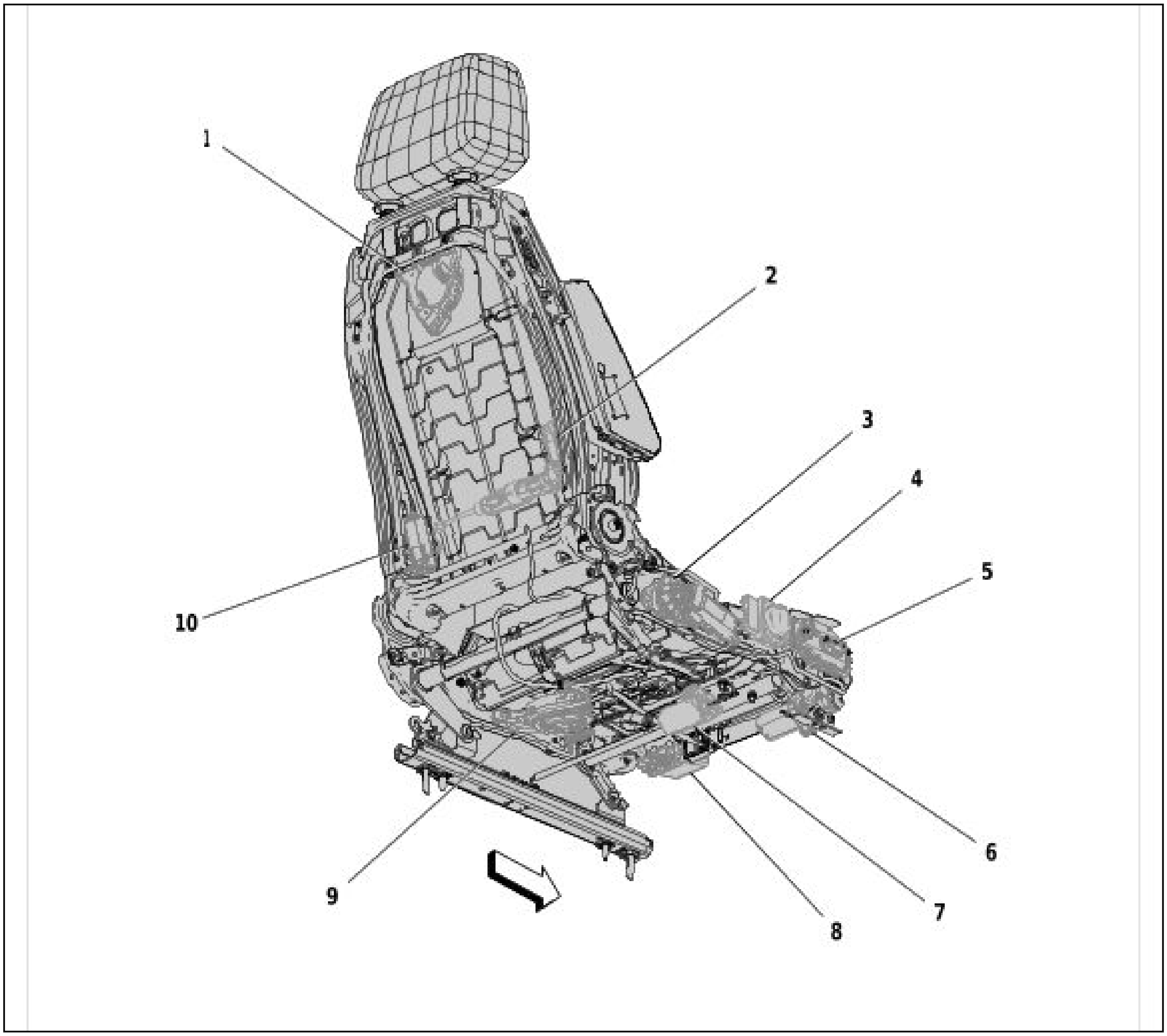
Passenger Seat Components 1 of 2



6396406

Items
(1) F106P Front Seat Outboard Seat Back Airbag - Passenger
(2) E14C Front Seat Back Heater - Passenger (KA1 / KQV)
(3) E14D Front Seat Cushion Heater - Passenger (KA1 / KQV)
(4) S64P Front Seat Adjuster Switch - Passenger
(5) S65P Front Seat Lumbar Switch - Passenger (A7K)
(6) M55P Front Seat Vertical Adjuster Actuator - Passenger

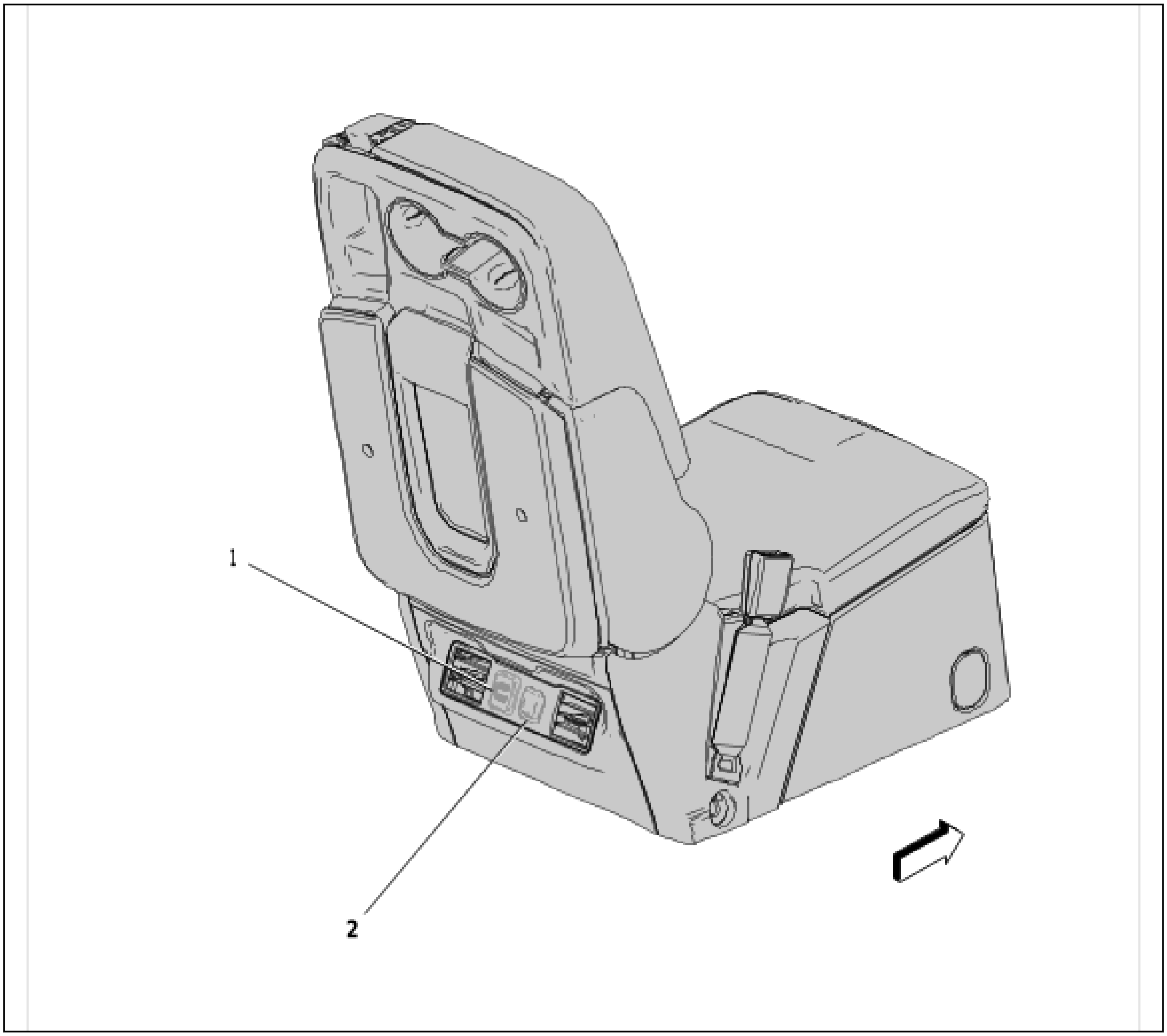
Passenger Seat Components 2 of 2



6398220

Items
(1) M73B Front Seat Back Ventilation Blower - Passenger (KQV)
(2) M53P Front Seat Back Lumbar Motor - Passenger
(3) M55P Front Seat Vertical Adjuster Actuator - Passenger
(4) S65P Front Seat Lumbar Switch - Passenger (A7K)
(5) S64P Front Seat Adjuster Switch - Passenger
(6) M50P Front Seat Tilt Adjuster Actuator - Passenger
(7) M51P Front Seat Adjuster Actuator - Passenger
(8) K29FV Front Seat Heater Vent Control Module (KA1 / KQV)
(9) M73P Front Seat Cushion Ventilation Blower - Passenger (KQV)
(10) M56P Front Seat Recliner Actuator - Passenger

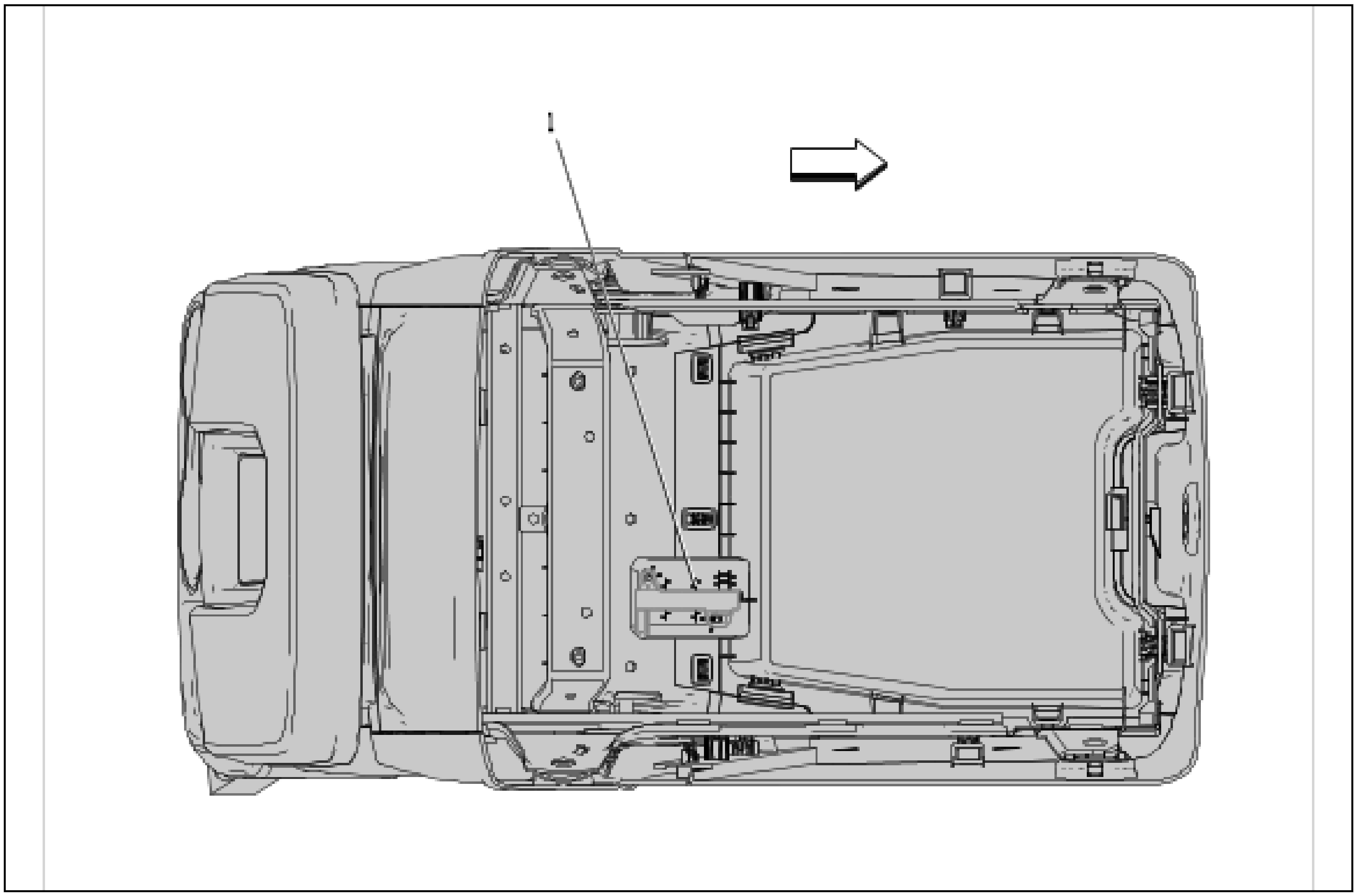
Front Center Seat Components 1 of 2



6396408

Items
(1) X92FSR Dual Charge Only Receptacle - Front Center Seat Rear Cover (AZ3 and UBI)
(2) X81FSA Accessory Power Receptacle - Front Center Seat Rear Cover 110V AC (AZ3 and KI4)

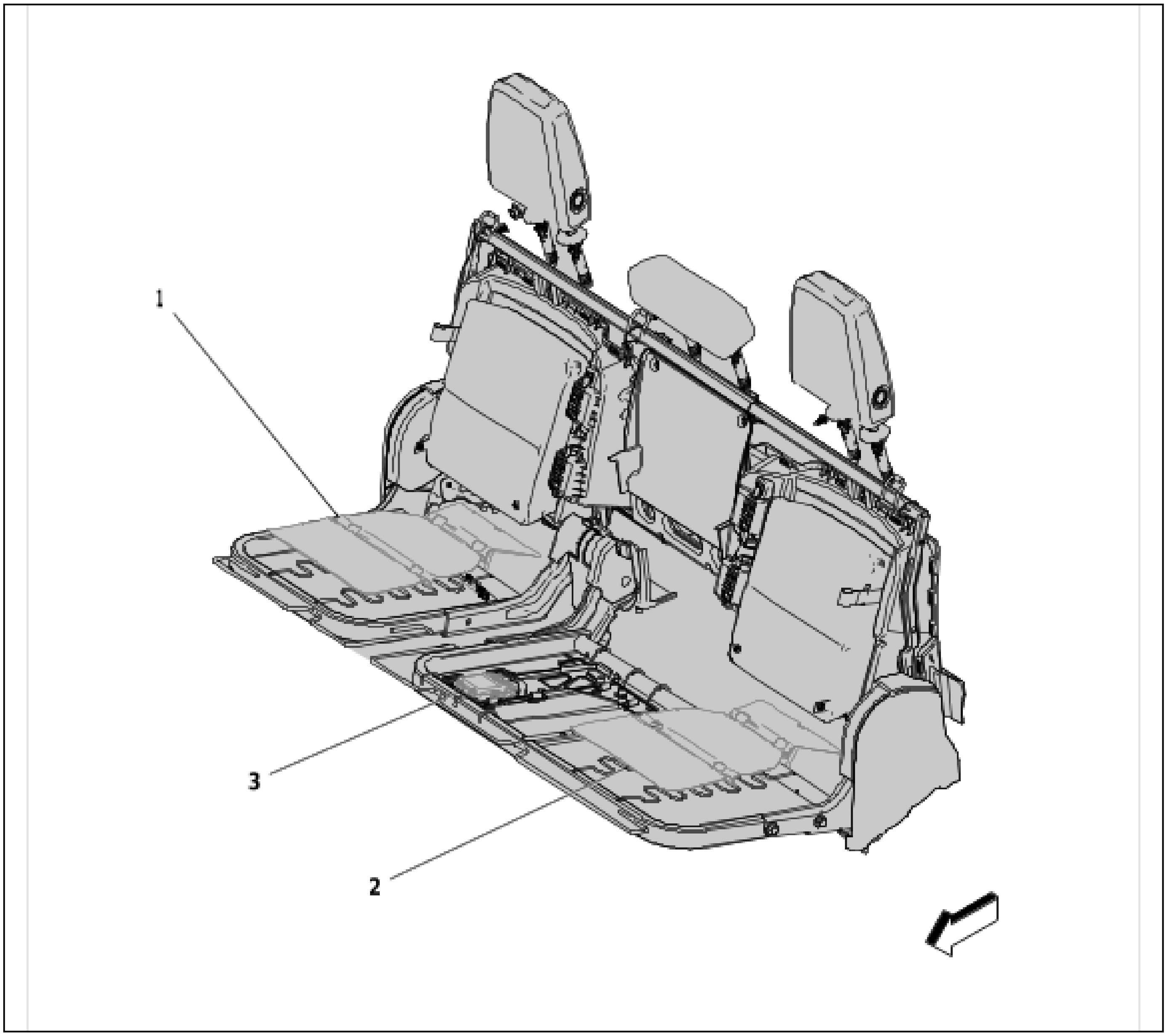
Front Center Seat Components 2 of 2



6398208

Items
(1) T10UA Low Frequency Console Antenna

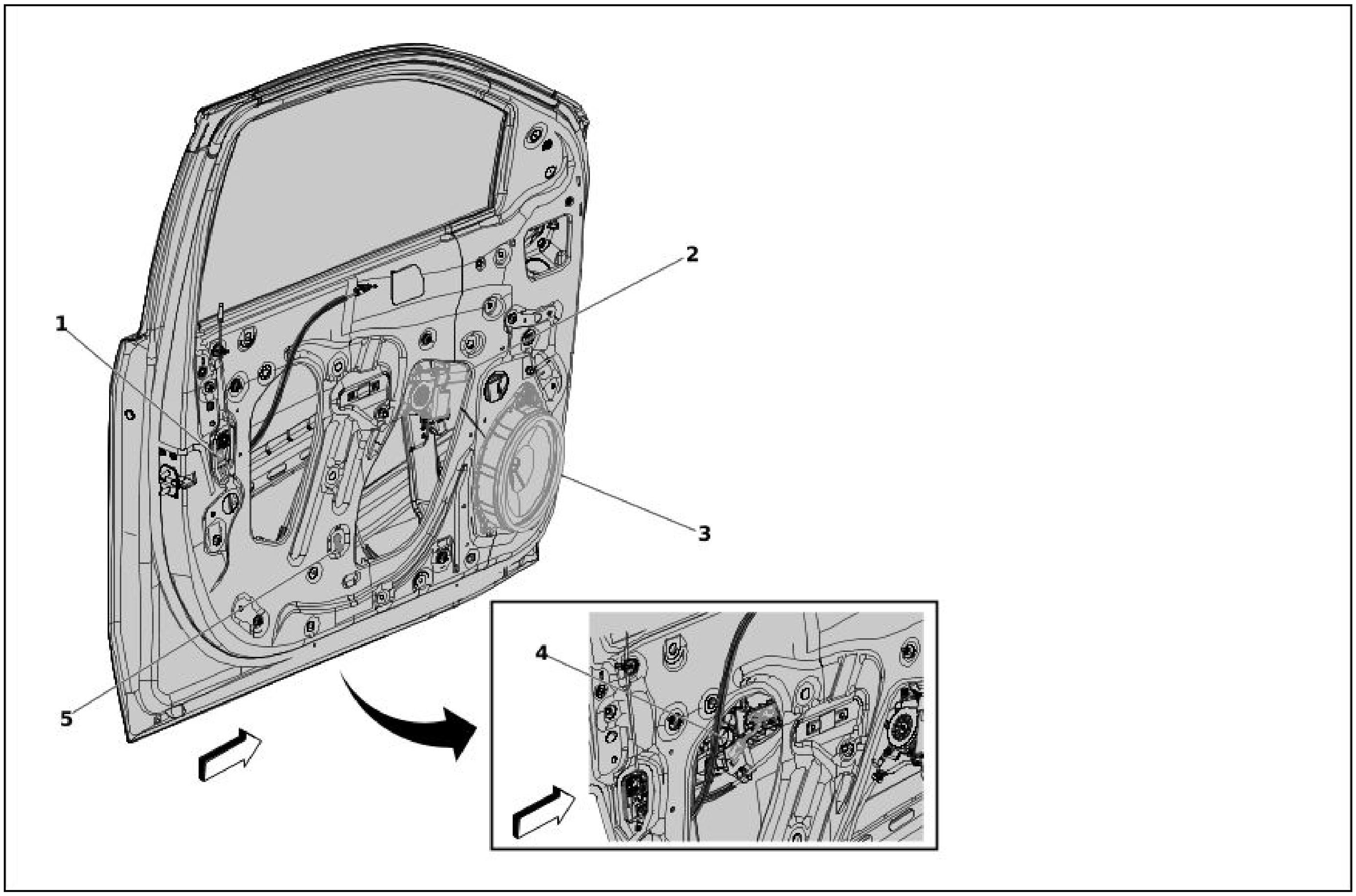
Rear Seat Components



6396410

Items
(1) E14H Rear Seat Cushion Heater - Right Rear (KA6)
(2) E14F Rear Seat Cushion Heater - Left Rear (KA6)
(3) K234 Rear Seat Heater Vent Control Module

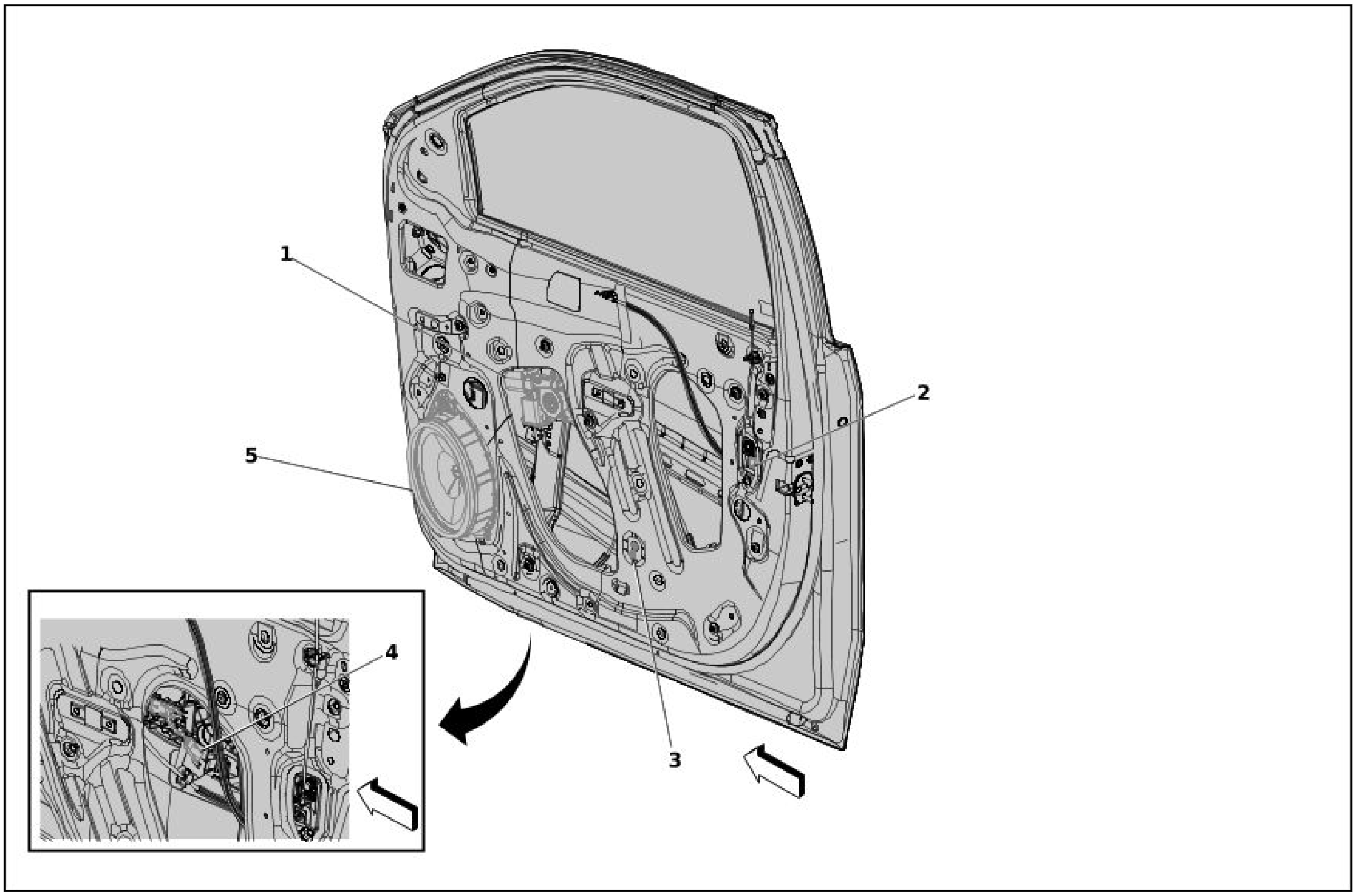
Driver Door Components



5241114

Items
(1) A23D Front Side Door Latch - Driver
(2) M74D Front Side Door Window Regulator Motor - Driver
(3) P19AG Radio Front Side Door Speaker - Left
(4) A24D Front Side Door Outside Handle - Left
(5) B63LF Airbag Side Impact Sensor - Left Front Door

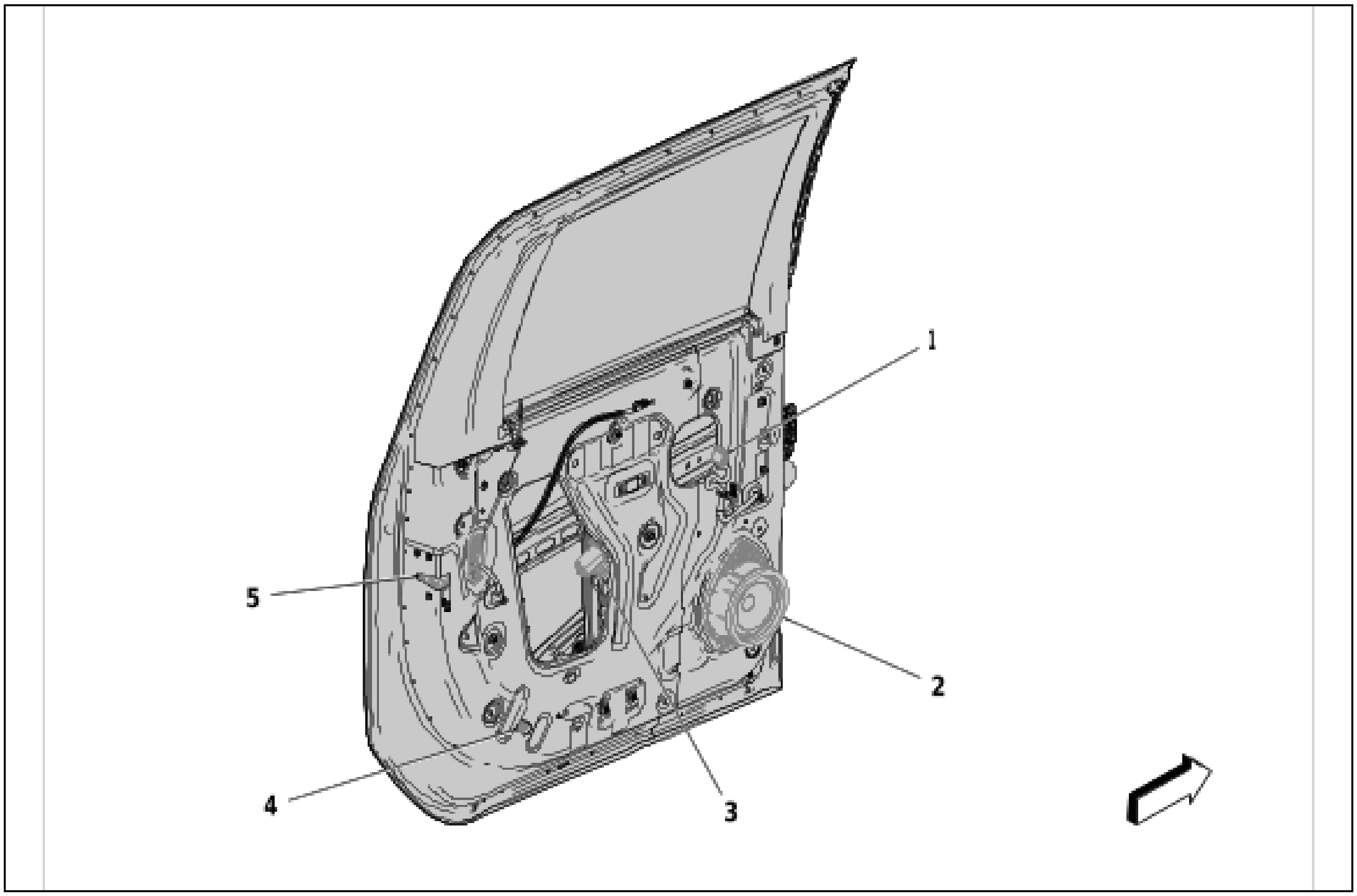
Passenger Door Components



5241116

Items
(1) M74P Front Side Door Window Regulator Motor - Passenger
(2) A23P Front Side Door Latch - Passenger
(3) B63RF Airbag Side Impact Sensor - Right Front Door
(4) A24P Front Side Door Outside Handle - Right
(5) P19AH Radio Front Side Door Speaker - Right

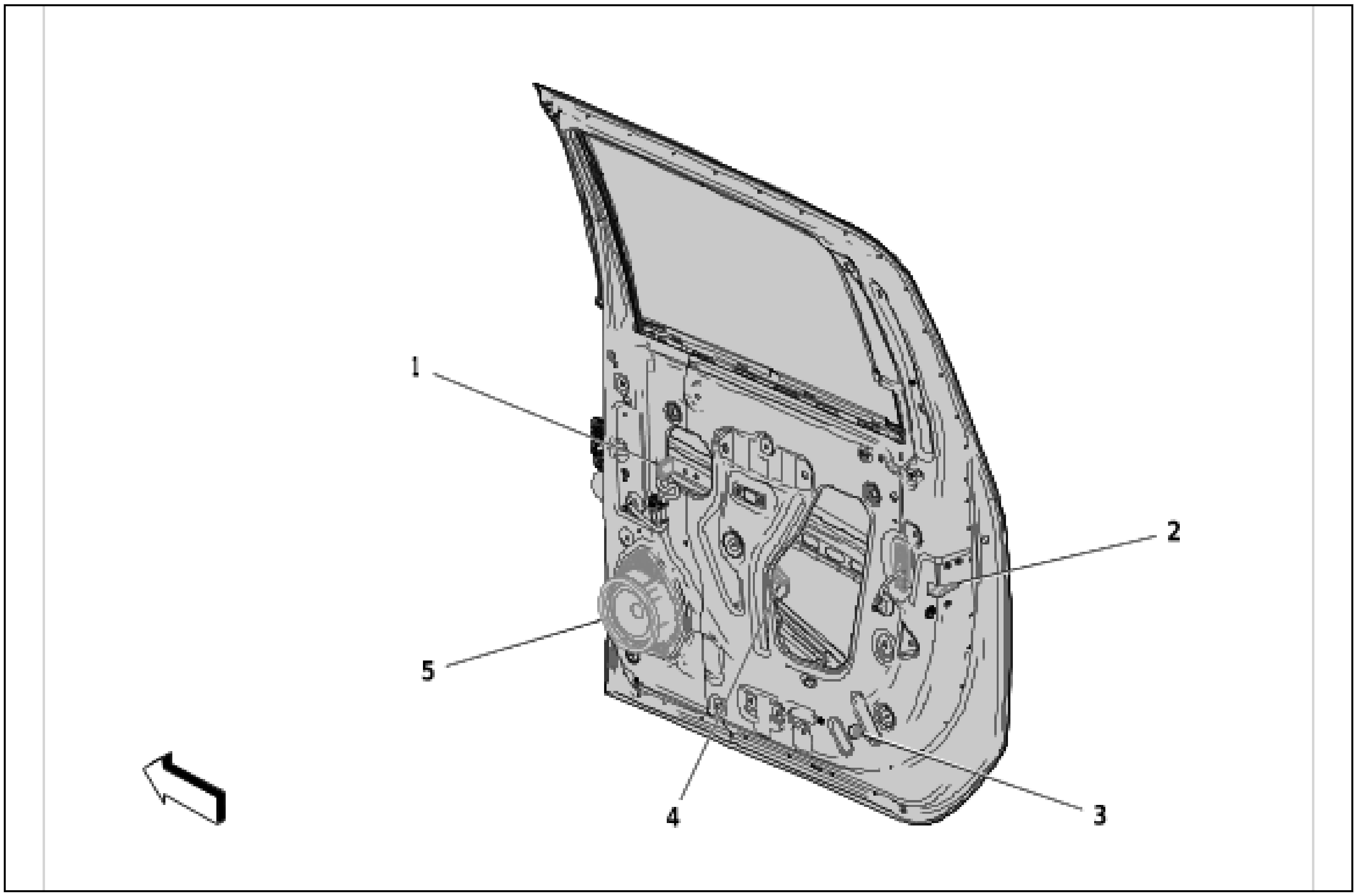
Left Rear Door Components - Crew/Extended Cab



6343111

Items
(1) S79LR Rear Side Door Window Switch - Left
(2) P19AL Radio Rear Side Door Speaker - Left
(3) M74LR Rear Side Door Window Regulator Motor - Left (Double Cab / Crew Cab)
(4) B63LR Airbag Side Impact Rear Sensor - Left Door (Double Cab / Crew Cab)
(5) A23LR Rear Side Door Latch - Left (Double Cab / Crew Cab)

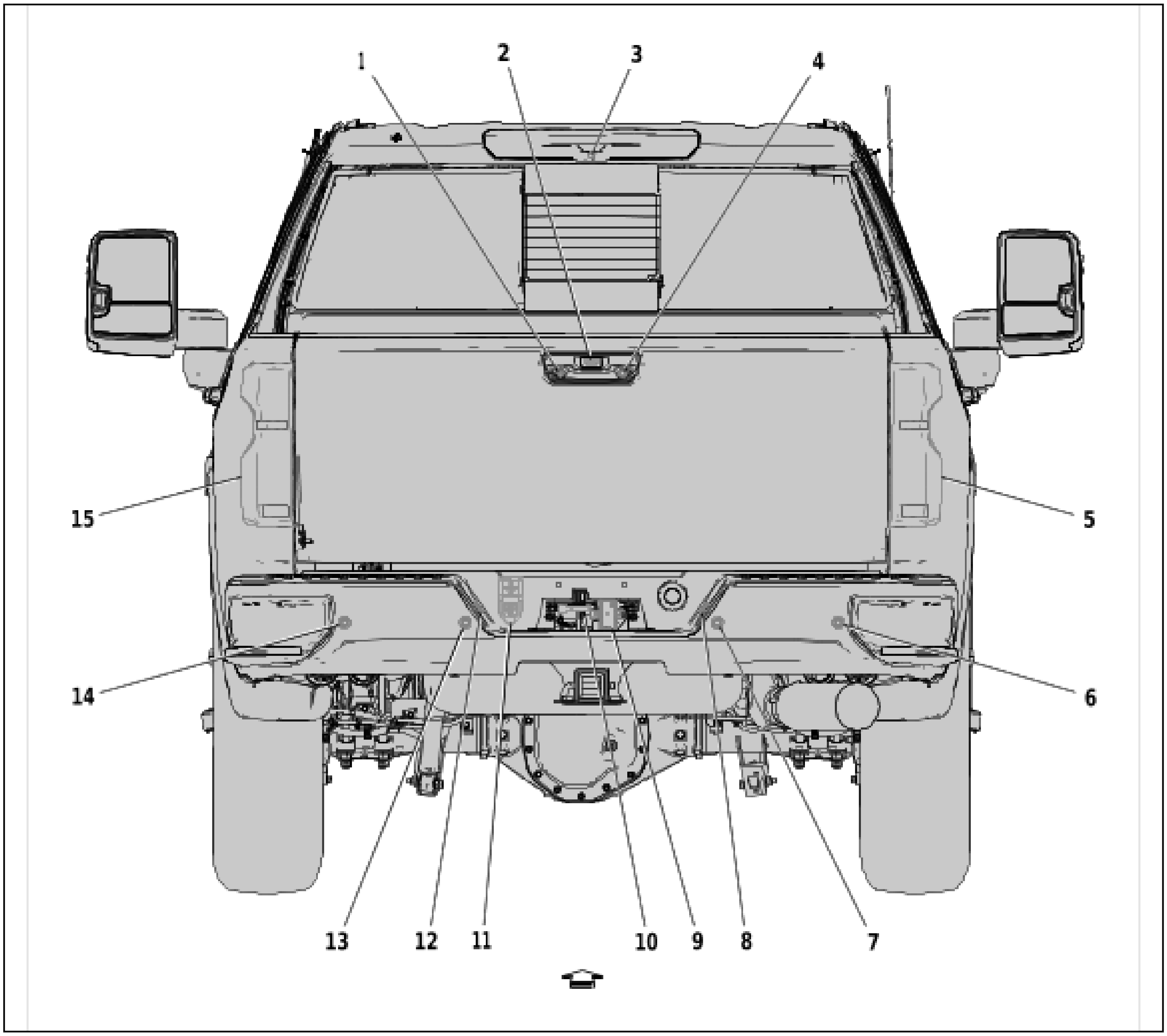
Right Rear Door Components - Crew/Extended Cab



6343112

Items
(1) S79RR Rear Side Door Window Switch - Right
(2) A23RR Rear Side Door Latch - Right (Double Cab / Crew Cab)
(3) B63RR Airbag Side Impact Rear Sensor - Right Door (Double Cab / Crew Cab)
(4) M74RR Rear Side Door Window Regulator Motor - Right (Double Cab / Crew Cab)
(5) P19AM Radio Rear Side Door Speaker - Right

Rear of Vehicle Components

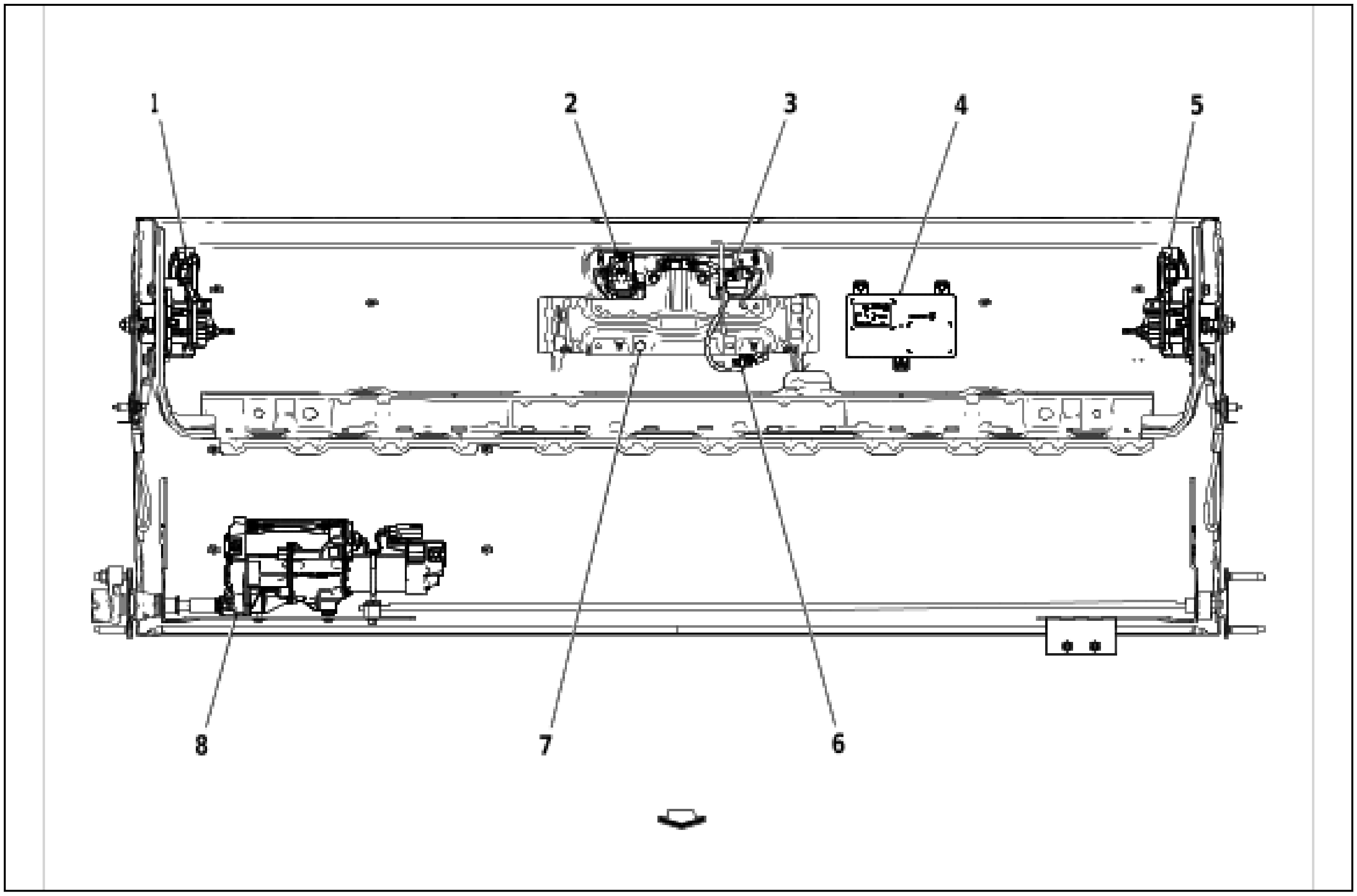


6215810

Items
(1) B87 Rearview Driver Information Camera (UVB / UV2)
(2) S159E Liftgate Exterior Release Switch - Endgate (QT6 / QK2)
(3) B352 Video Display Inside Rearview Mirror Camera (DRZ)
(4) E33TH Rear Closure Auxiliary Signal Lamp
(5) E42R Rear Body Structure Stop Lamp - Right
(6) B306H Parking Assist Alarm Sensor - Rear Right Outer (UD5 / UD7)
(7) B306G Parking Assist Alarm Sensor - Rear Right Middle (UD5 / UD7)
(8) E7R Rear License Plate Lamp - Right (E63)
(9) K214 Trailer Tire Pressure Indicator Module (UET)
(10) T10G Low Frequency Rear Bumper Antenna

Items
(11) X88B Tow Vehicle Electrical Receptacle
(12) E7L Rear License Plate Lamp - Left (E63)
(13) B306F Parking Assist Alarm Sensor - Rear Left Middle (UD5 / UD7)
(14) B306E Parking Assist Alarm Sensor - Rear Left Outer (UD5 / UD7)
(15) E42L Rear Body Structure Stop Lamp - Left

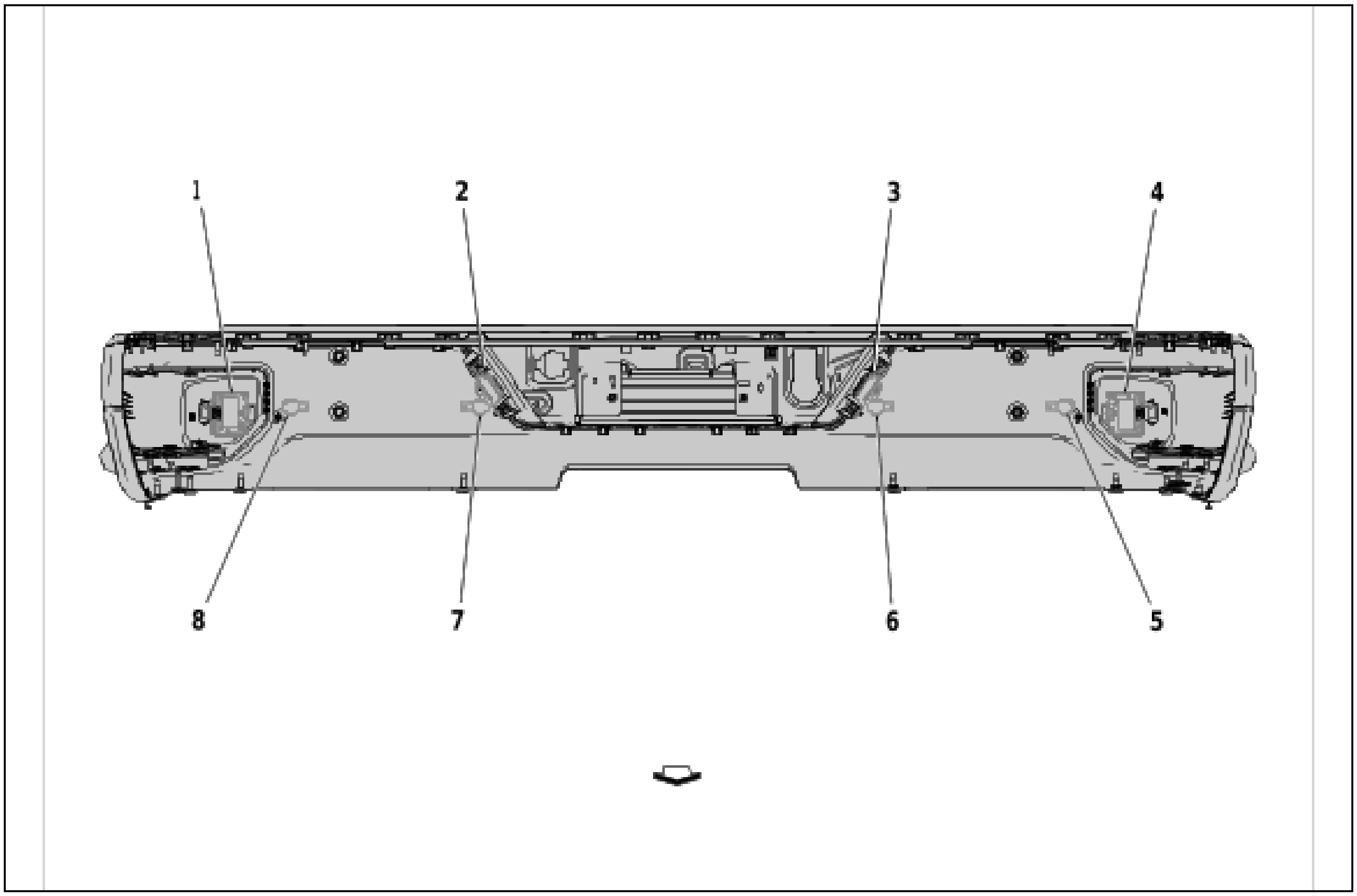
Endgate Components



6215813

Items
(1) M151R Pickup Box Endgate Cinch Latch Actuator - Right (QT6)
(2) E33TH Rear Closure Auxiliary Signal Lamp
(3) B87 Rearview Driver Information Camera (UVB / UV2)
(4) K194 Rear Gate Module (QT6)
(5) M151L Pickup Box Endgate Cinch Latch Actuator - Left (QT6)
(6) S159E Liftgate Exterior Release Switch - Endgate (QT6 / QK2)
(7) M14A Pickup Box Endgate Lock Actuator (QK1)
(8) M125 Pickup Box Endgate Power Assist Actuator (QT6)

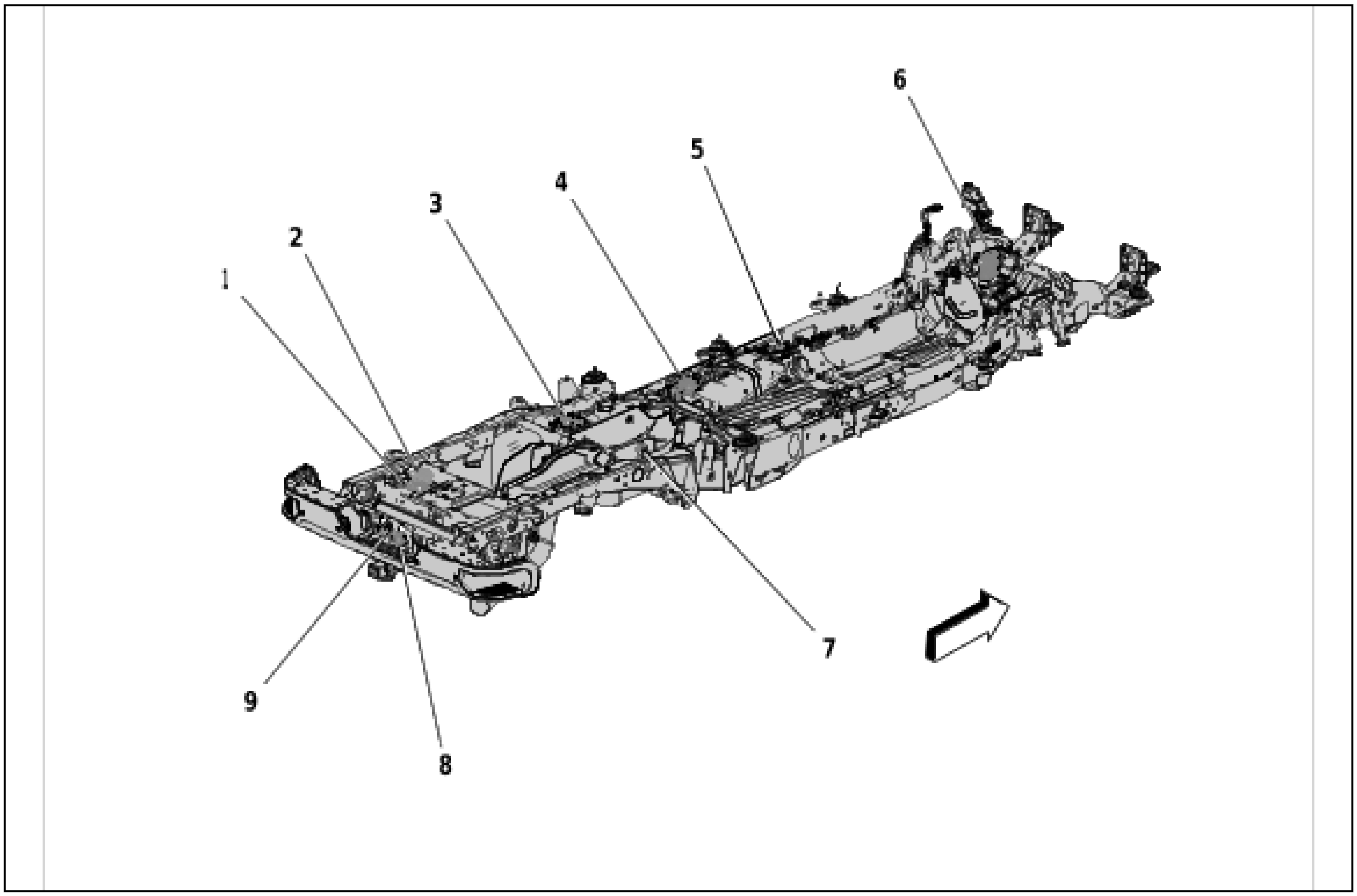
Rear Bumper - Inside



6215815

Items
(1) B218R Side Obstacle Detection Control Module - Right (UKC)
(2) E7R Rear License Plate Lamp - Right (E63)
(3) E7L Rear License Plate Lamp - Left (E63)
(4) B218L Side Obstacle Detection Control Module - Left (UKC)
(5) B306E Parking Assist Alarm Sensor - Rear Left Outer (UD5 / UD7)
(6) B306F Parking Assist Alarm Sensor - Rear Left Middle (UD5 / UD7)
(7) B306G Parking Assist Alarm Sensor - Rear Right Middle (UD5 / UD7)
(8) B306H Parking Assist Alarm Sensor - Rear Right Outer (UD5 / UD7)

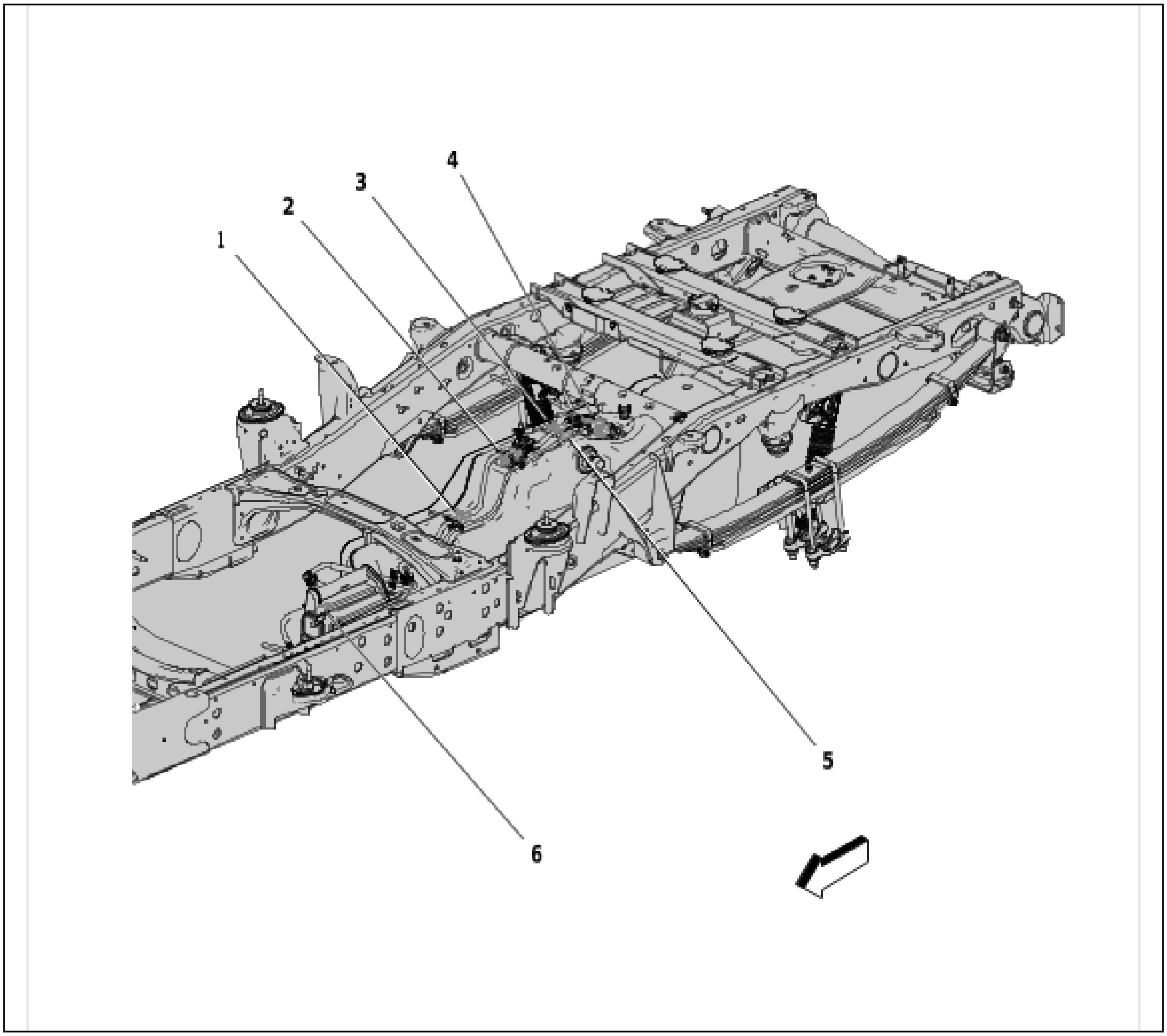
Underbody Components



6215816

Items
(1) K67 Trailer Brake Control Module (JL1)
(2) K111 Fuel Pump Power Control Module
(3) A7 Fuel Tank Fuel Pump Module
(4) R29 Fuel Filter (L5P)
(5) B47 Fuel Pressure Sensor
(6) K43 Power Steering Control Module
(7) B345P Exhaust Pressure Differential Sensor - Particulate Filter (L5P)
(8) K214 Trailer Tire Pressure Indicator Module (UET)
(9) T10G Low Frequency Rear Bumper Antenna

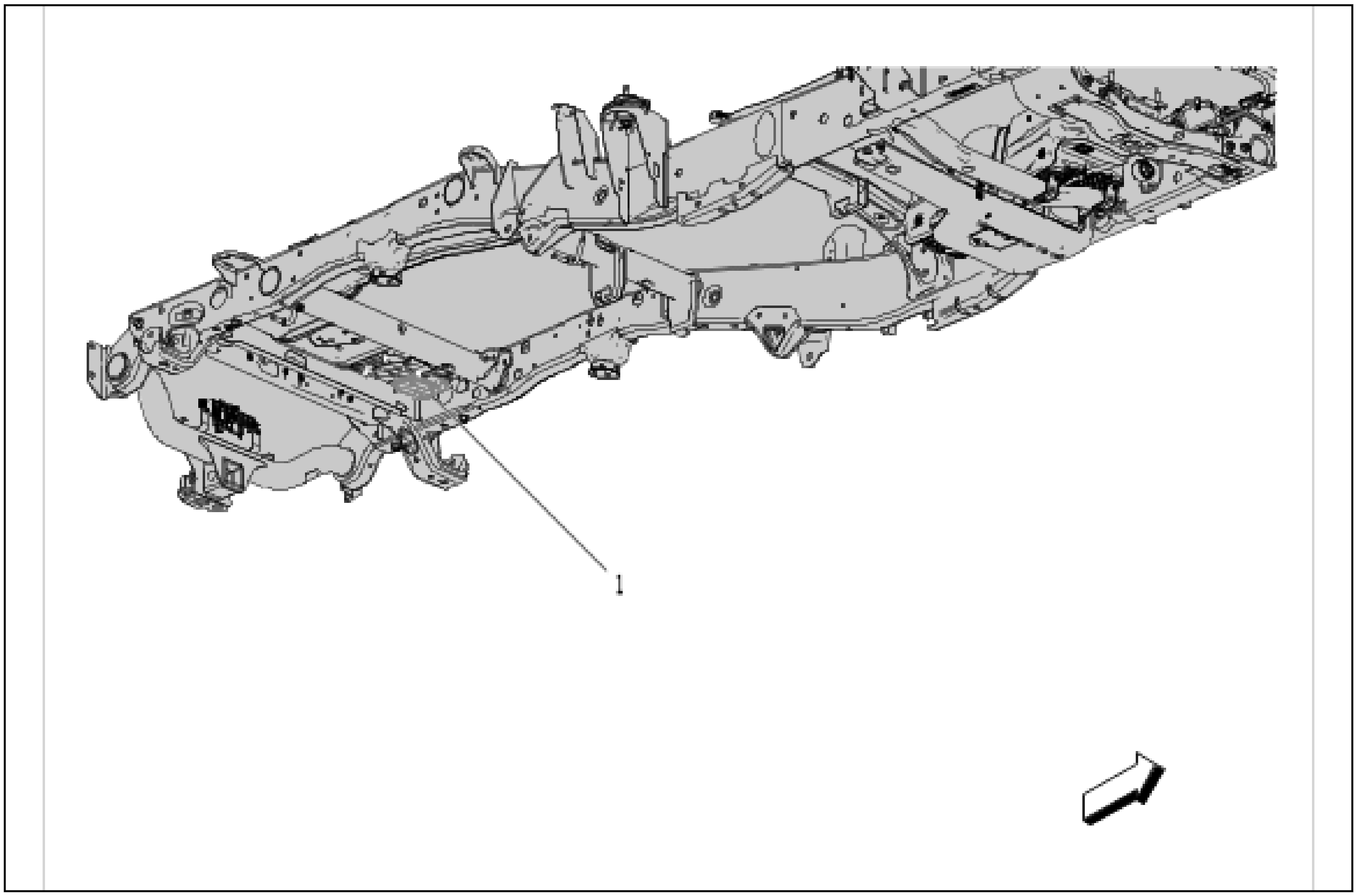
Fuel Tank Components (L8T)



6215818

Items
(1) B394 Evaporative Emission Canister Purge System Pressure Sensor
(2) Q64 Evaporative Emission System Switching Valve (L8T)
(3) B150 Fuel Tank Pressure Sensor (L8T)
(4) A7 Fuel Tank Fuel Pump Module
(5) B47 Fuel Pressure Sensor
(6) Q13 Evaporative Emission Canister Vent Solenoid Valve

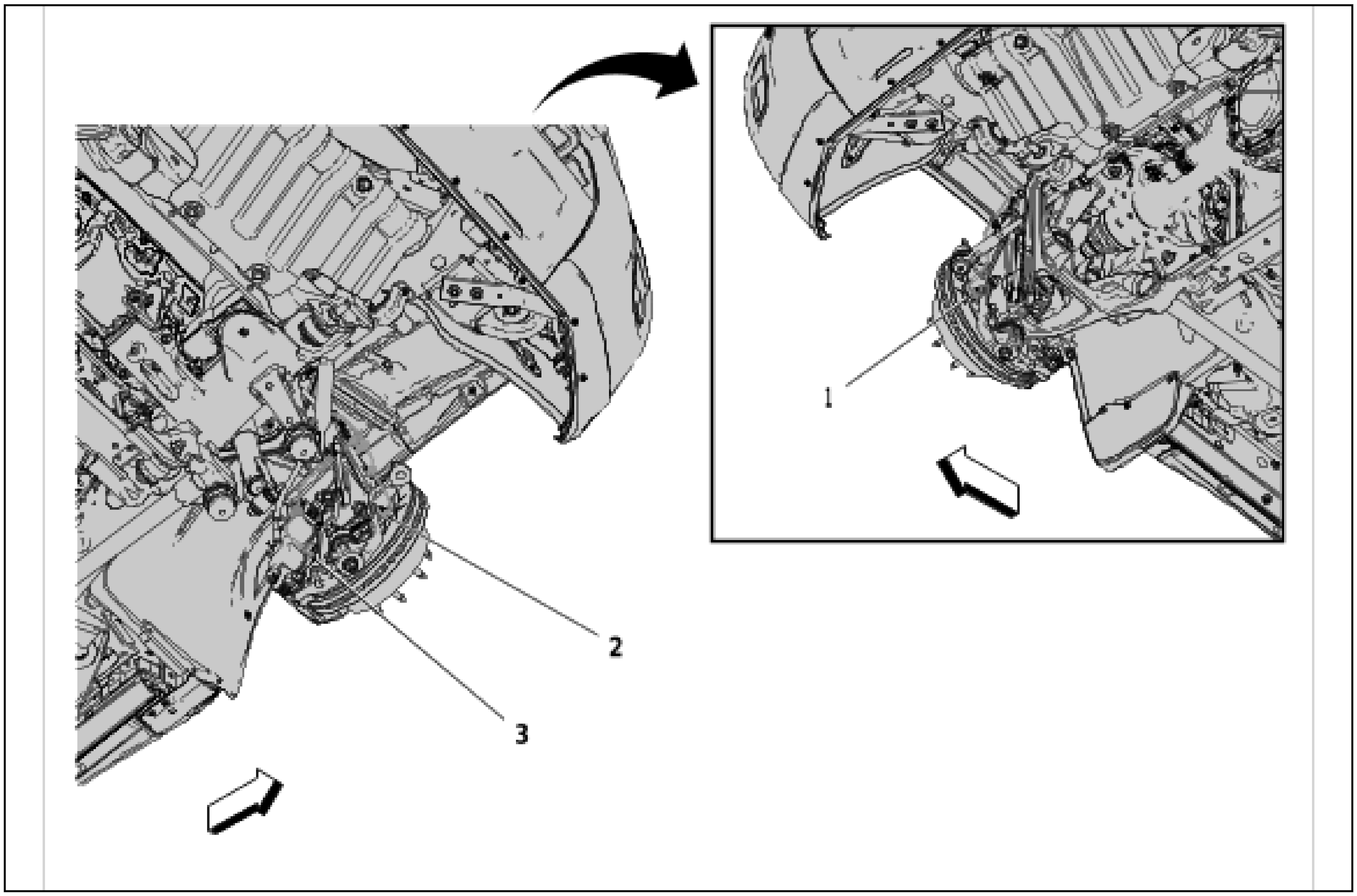
Rear Underbody Components



6215819

Items
(1) K68 Trailer Lamp Control Module (UET)

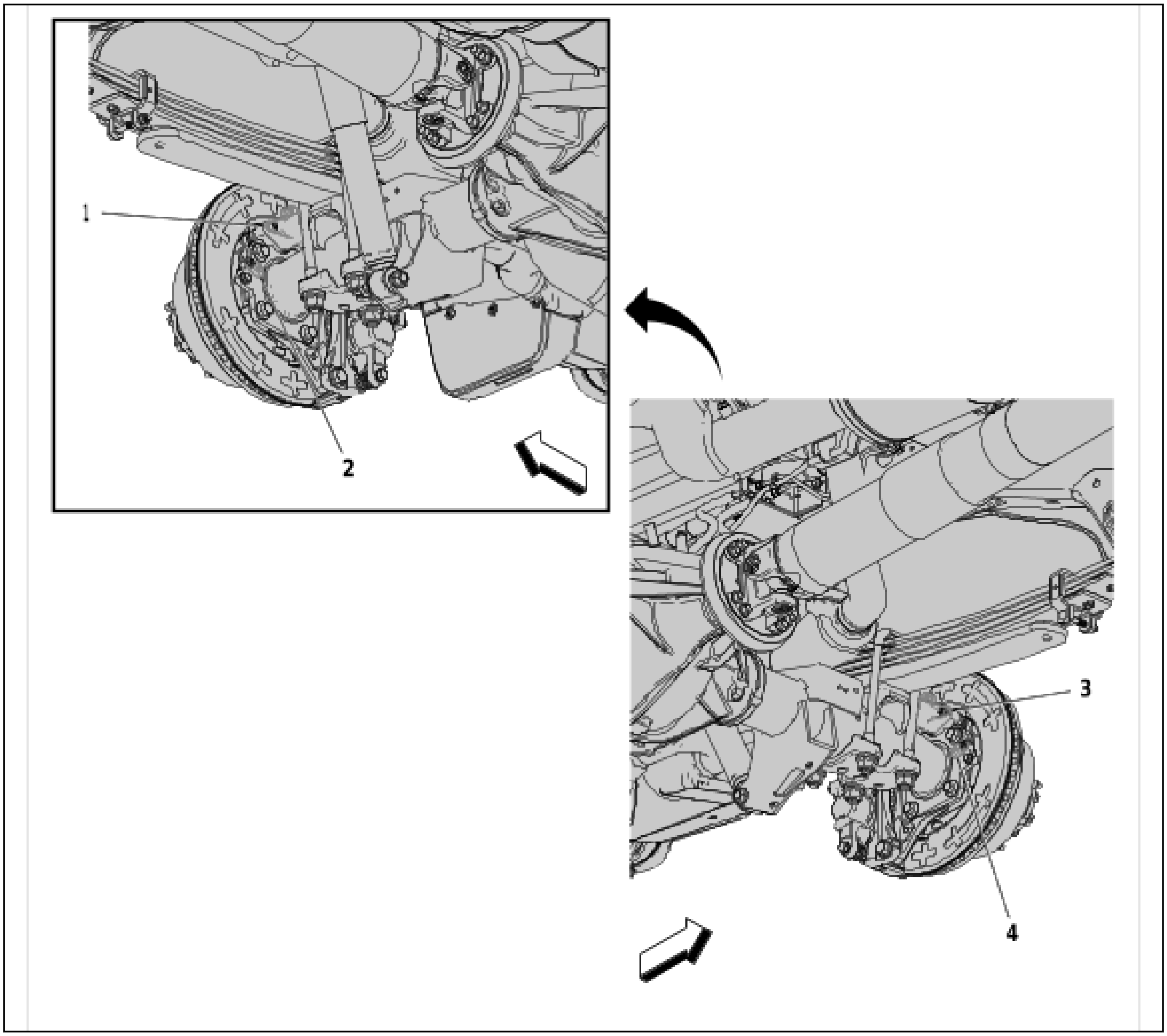
Front Brake and Suspension Components



6215820

Items
(1) B5RF Front Wheel Speed Sensor - Right
(2) B5LF Front Wheel Speed Sensor - Left
(3) B172LF Front Disc Brake Pad Wear Sensor - Left

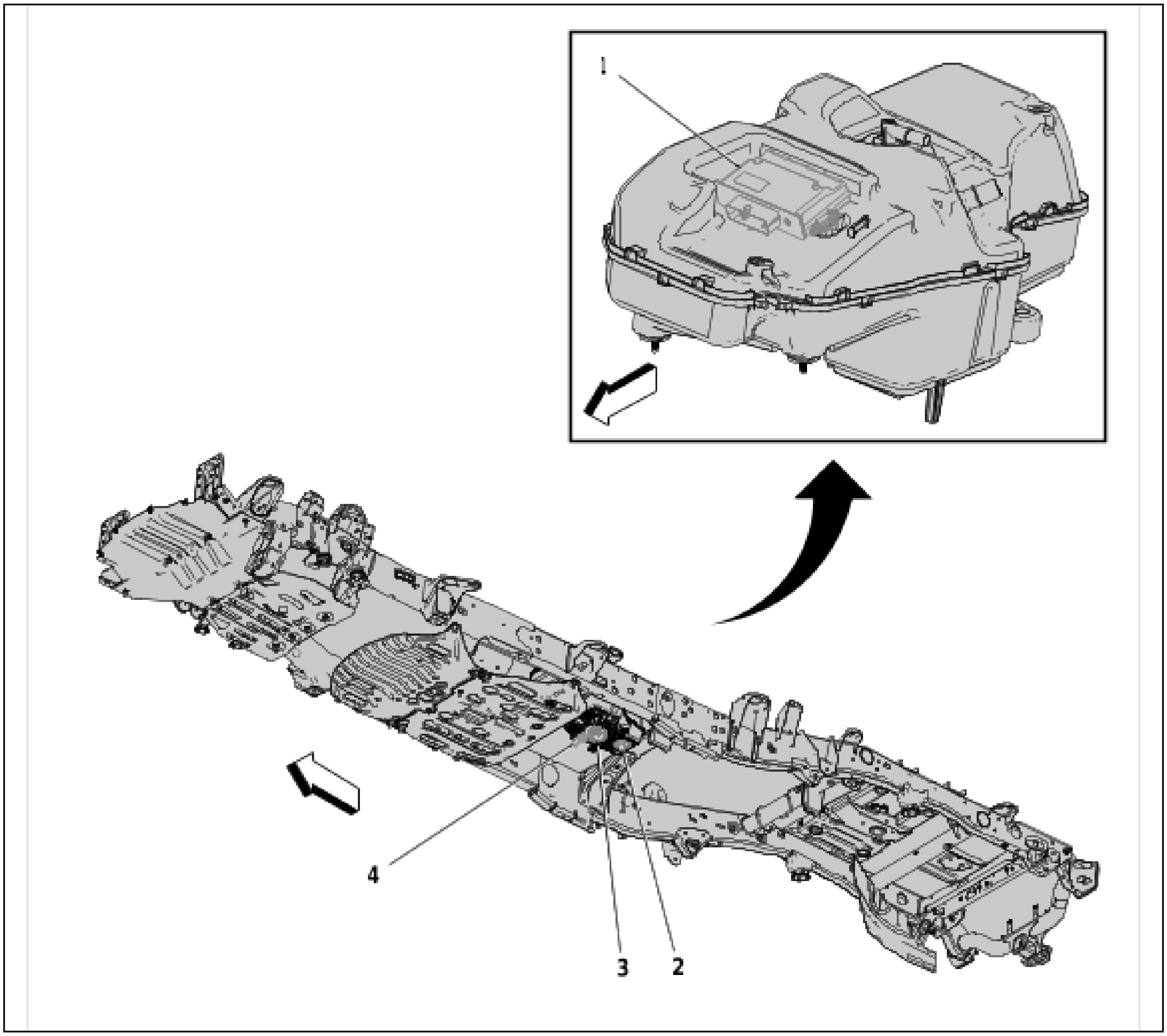
Rear Brake and Suspension Components



6215821

Items
(1) M104R Parking Brake Actuator - Right
(2) B5RR Rear Wheel Speed Sensor - Right
(3) M104L Parking Brake Actuator - Left
(4) B5LR Rear Wheel Speed Sensor - Left

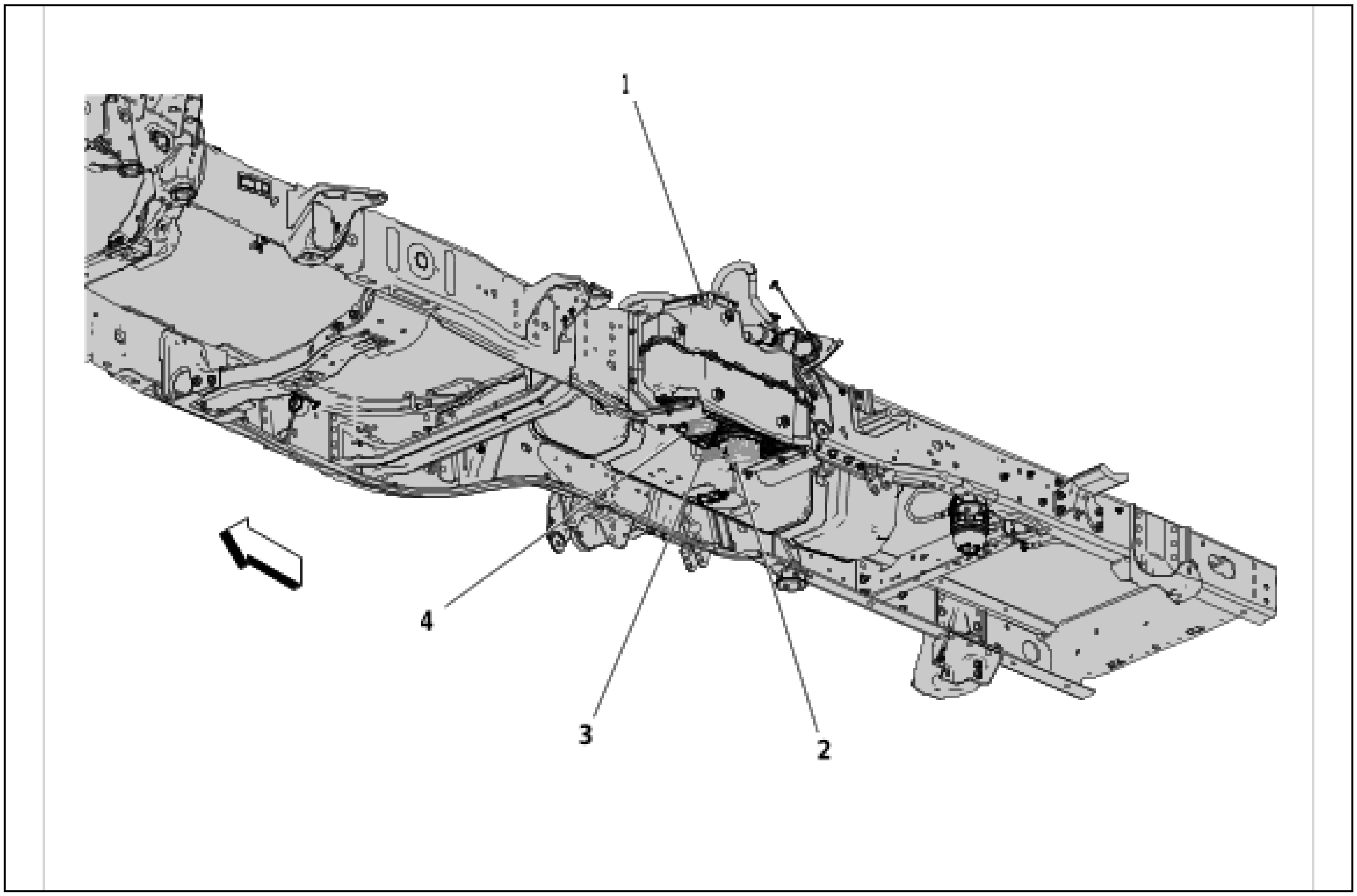
Reductant Fluid Tank Components - Pickup



6400073

Items
(1) K115 Reductant Control Module (L5P)
(2) B212 Reductant Tank Fluid Sensor (L5P)
(3) A38 Reductant Tank Fluid Supply Pump Module (L5P)
(4) E52 Reductant Heater 2 - Injector Supply Pipe (L5P)

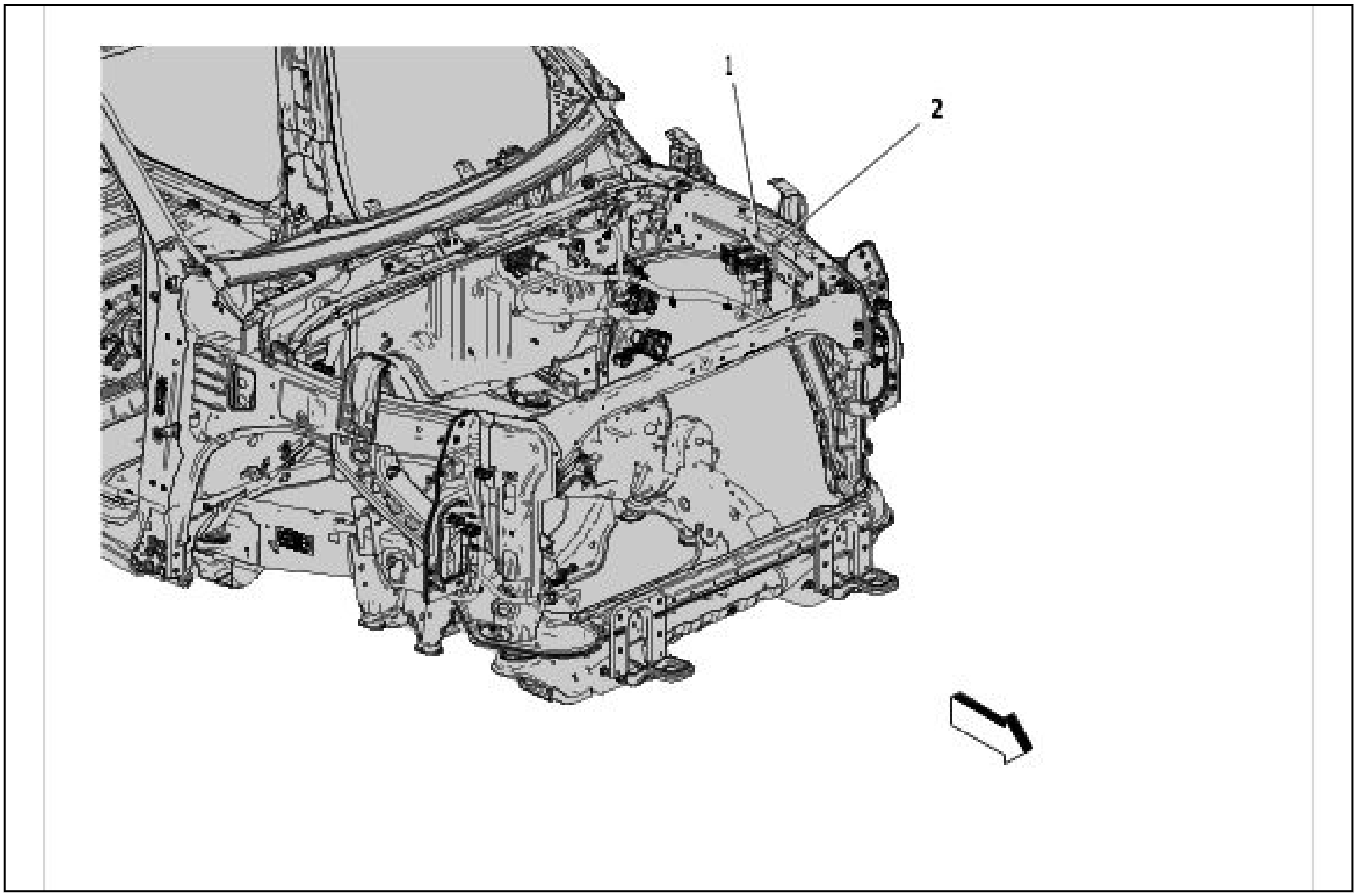
Reductant Fluid Tank Components - Chassis Cab



6400078

Items
(1) K115 Reductant Control Module (L5P)
(2) A38 Reductant Tank Fluid Supply Pump Module (L5P)
(3) E52 Reductant Heater 2 - Injector Supply Pipe (L5P)
(4) B212 Reductant Tank Fluid Sensor (L5P)

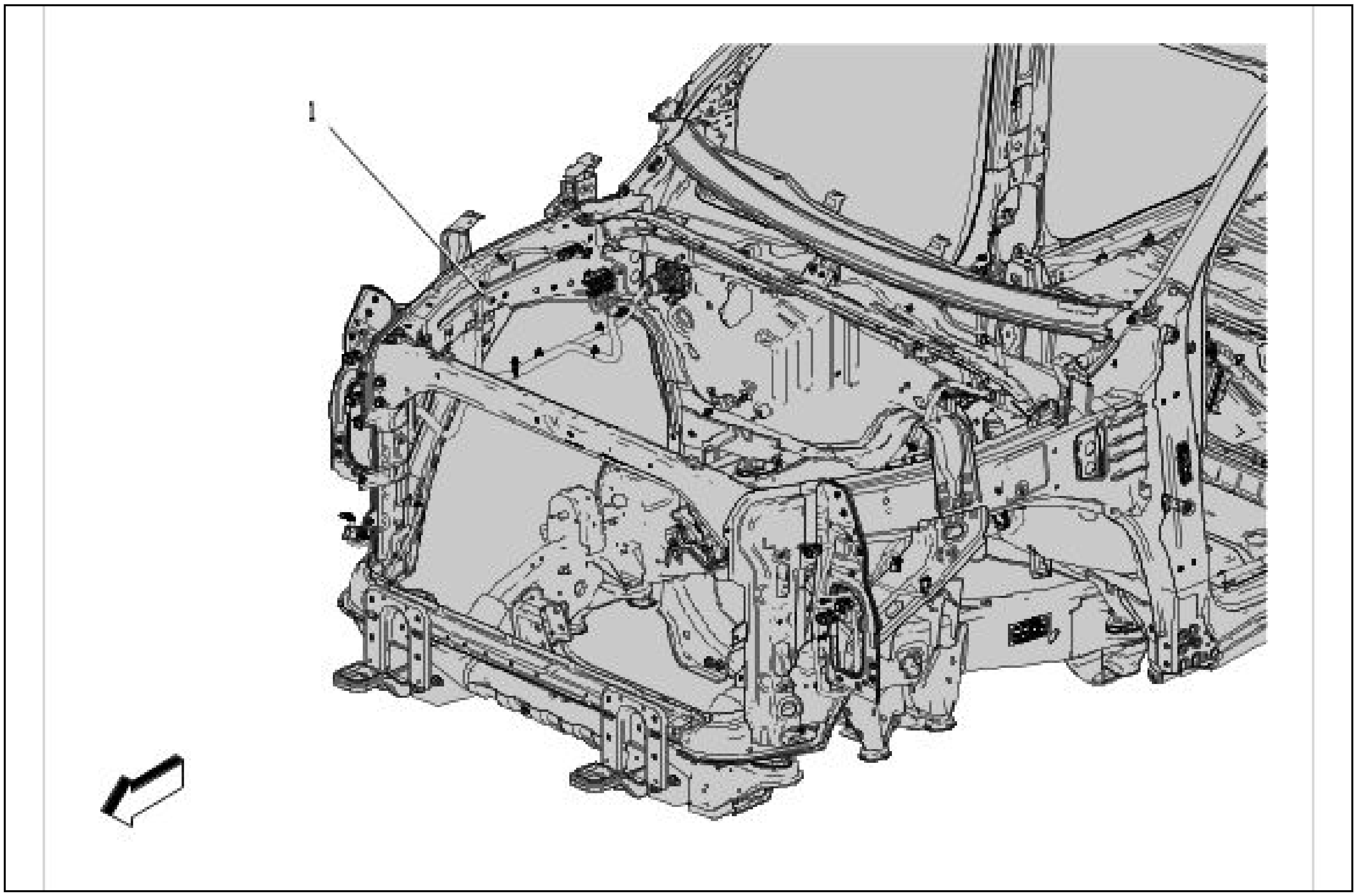
G103A and G103B



6215822

Items
(1) G103A Body Wiring Harness
(2) G103B Body Wiring Harness

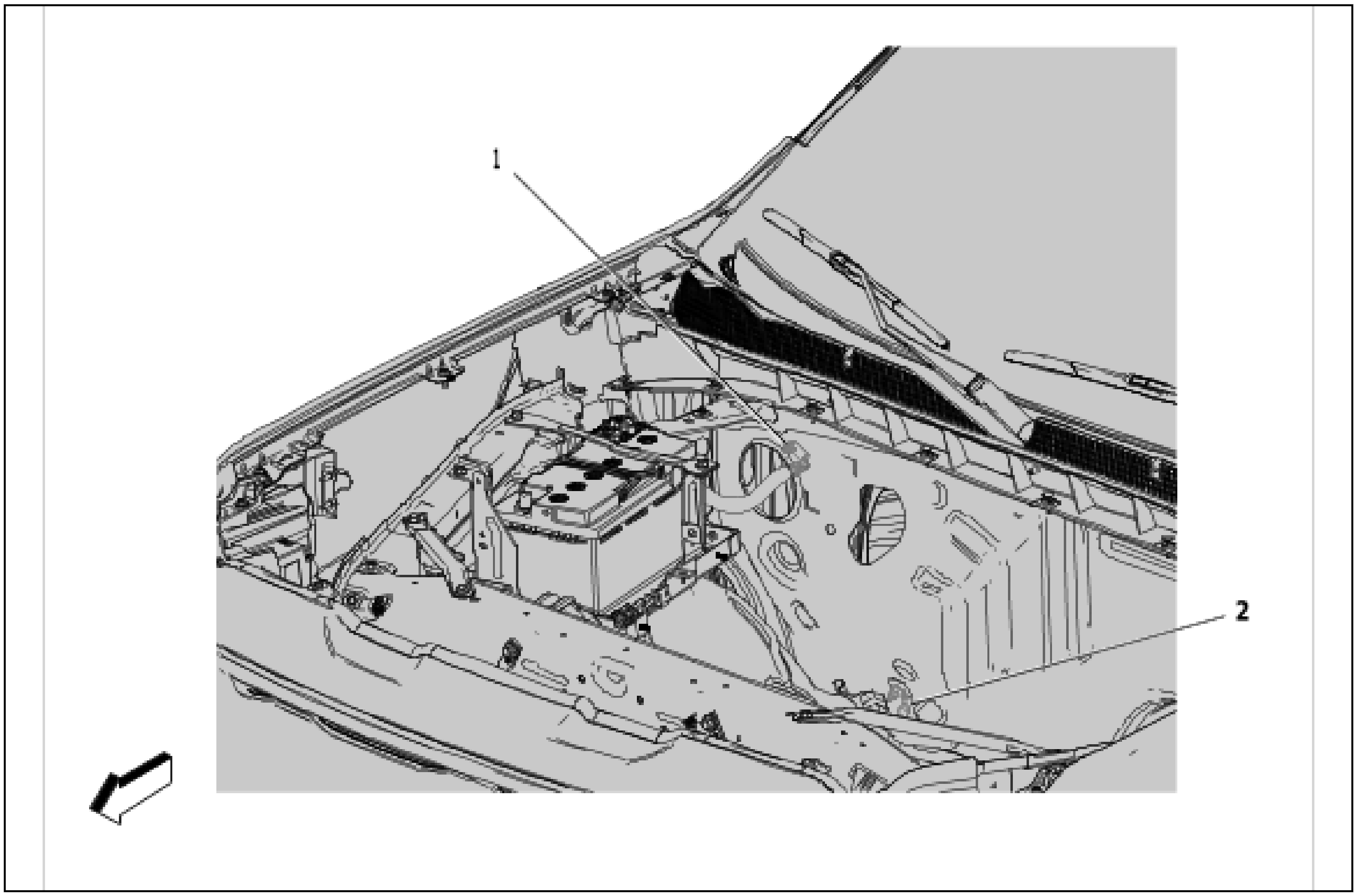
G104



6215823

Items
(1) G104 Body Wiring Harness

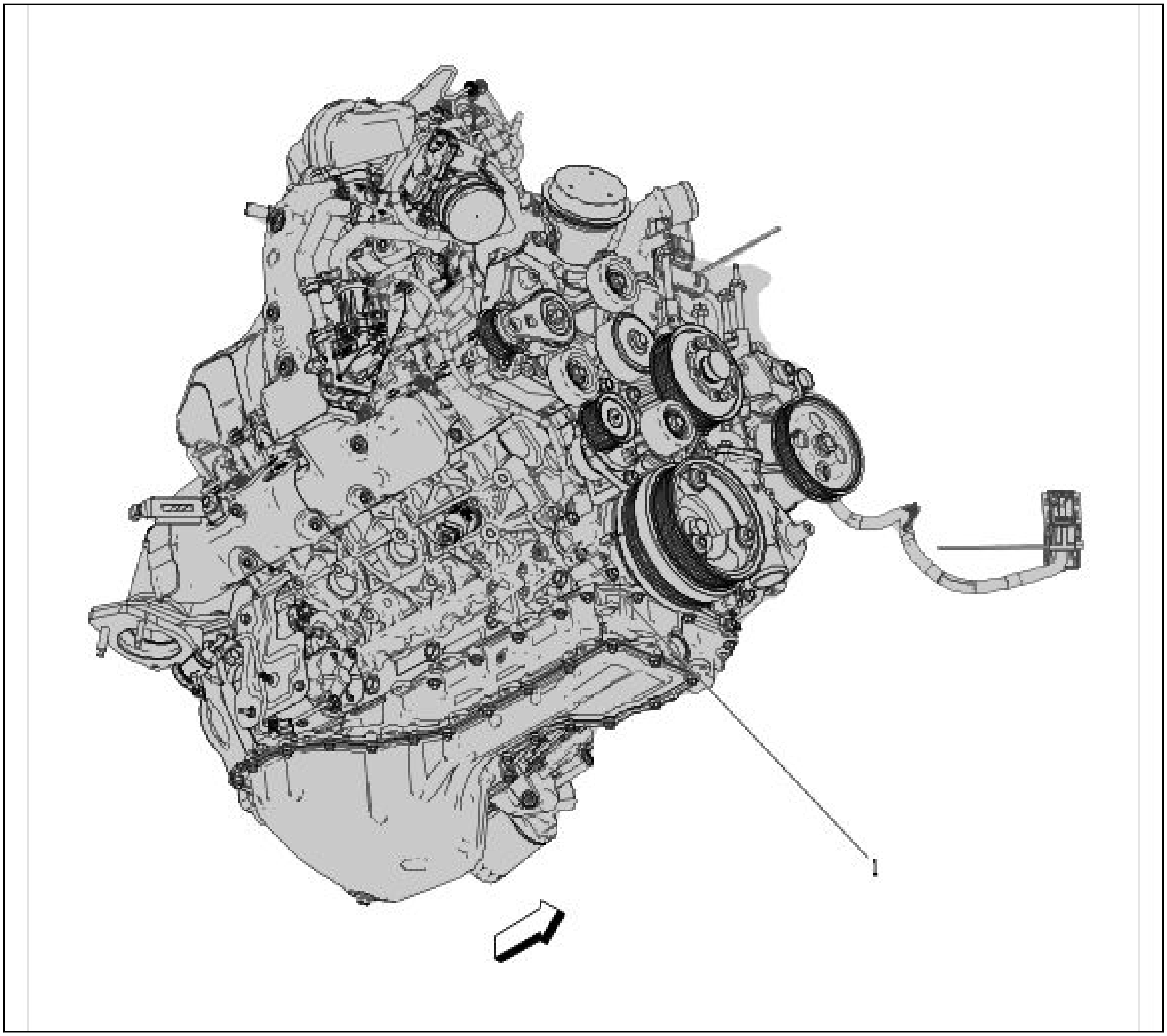
G105 and G134



6050092

Items
(1) G105 Battery Negative Cable
(2) G134 Ground Strap

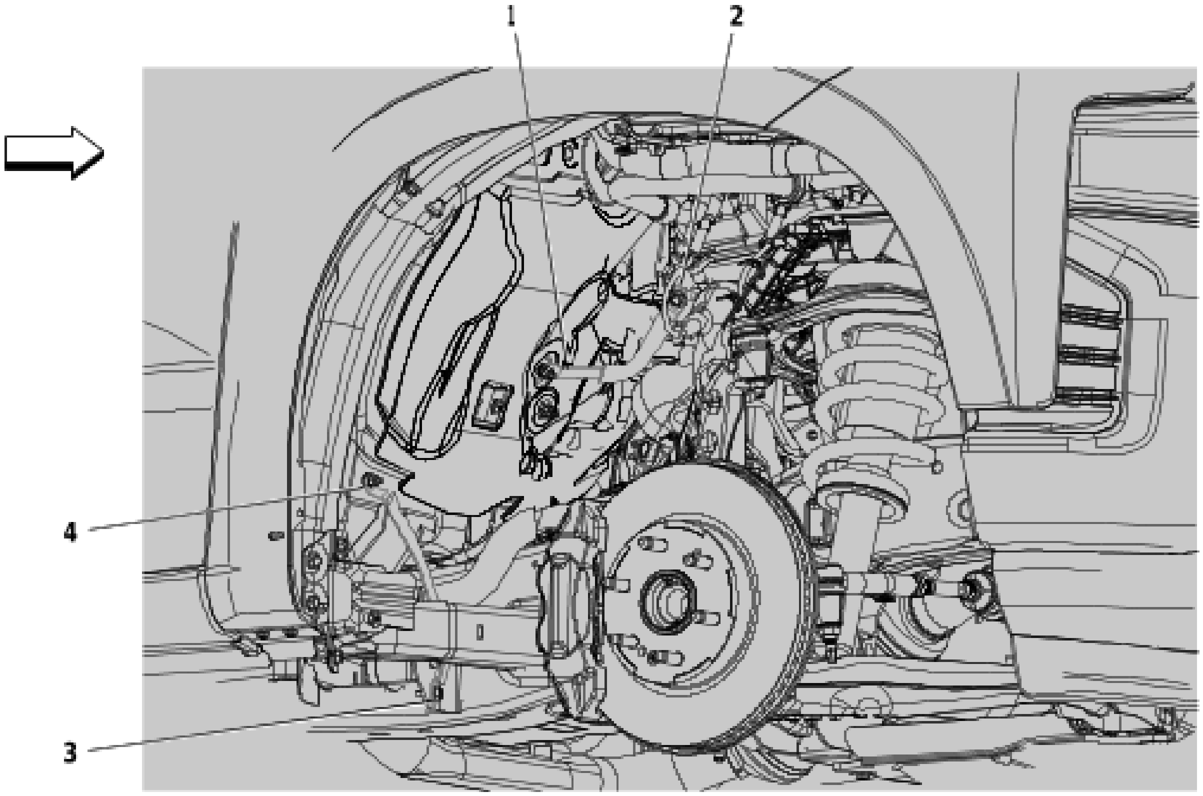
G114 (L5P)



6215825

Items
(1) G114 Engine Wiring Harness

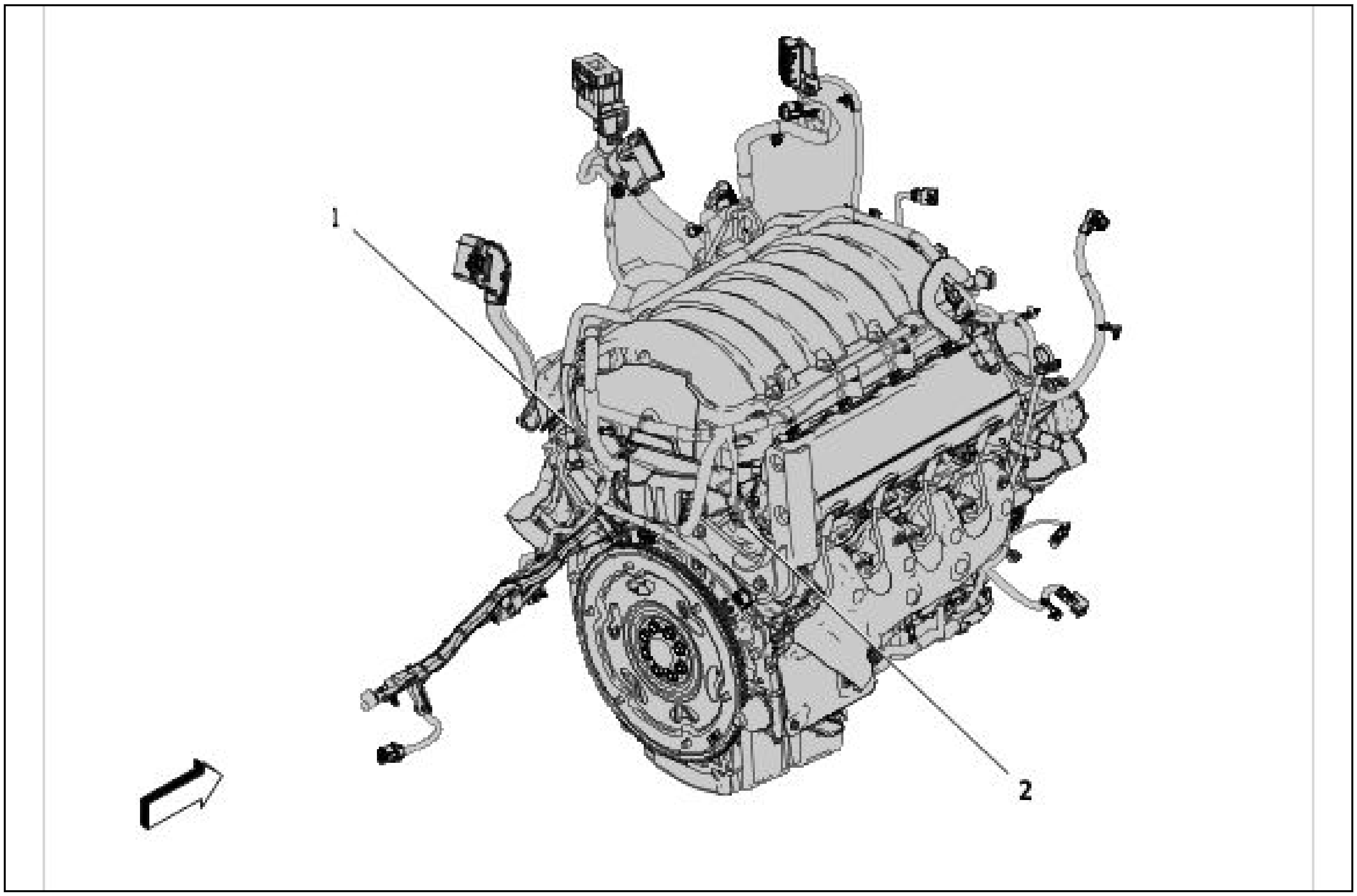
G131, G132, G133, and G134



6370948

Items
(1) G132 Ground Strap
(2) G134 Ground Strap
(3) G131 Ground Strap
(4) G133 Ground Strap

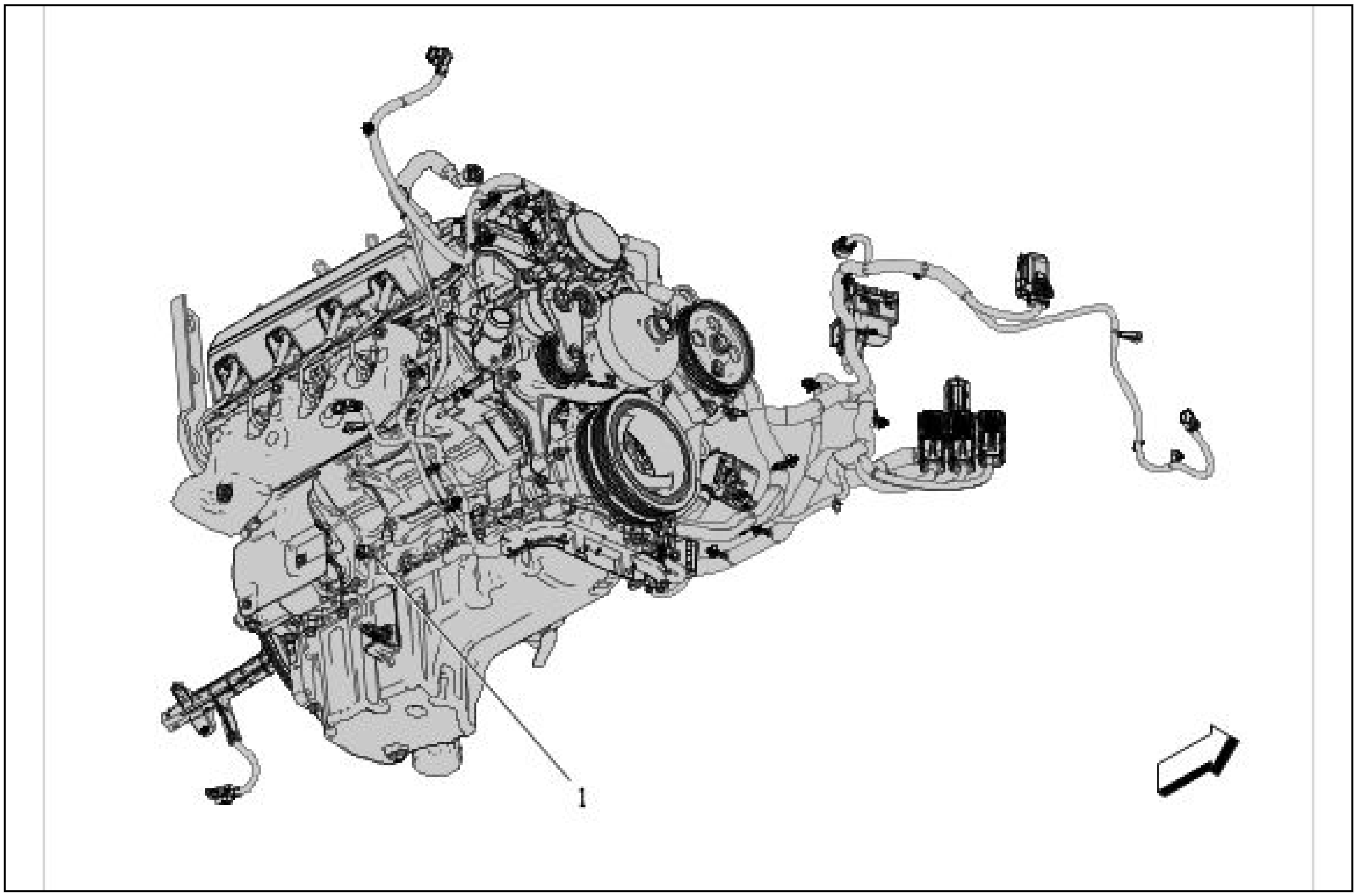
G175L and G176R



6215829

Items
(1) G175L Engine Wiring Harness (L8T)
(2) G176R Engine Wiring Harness (L8T)

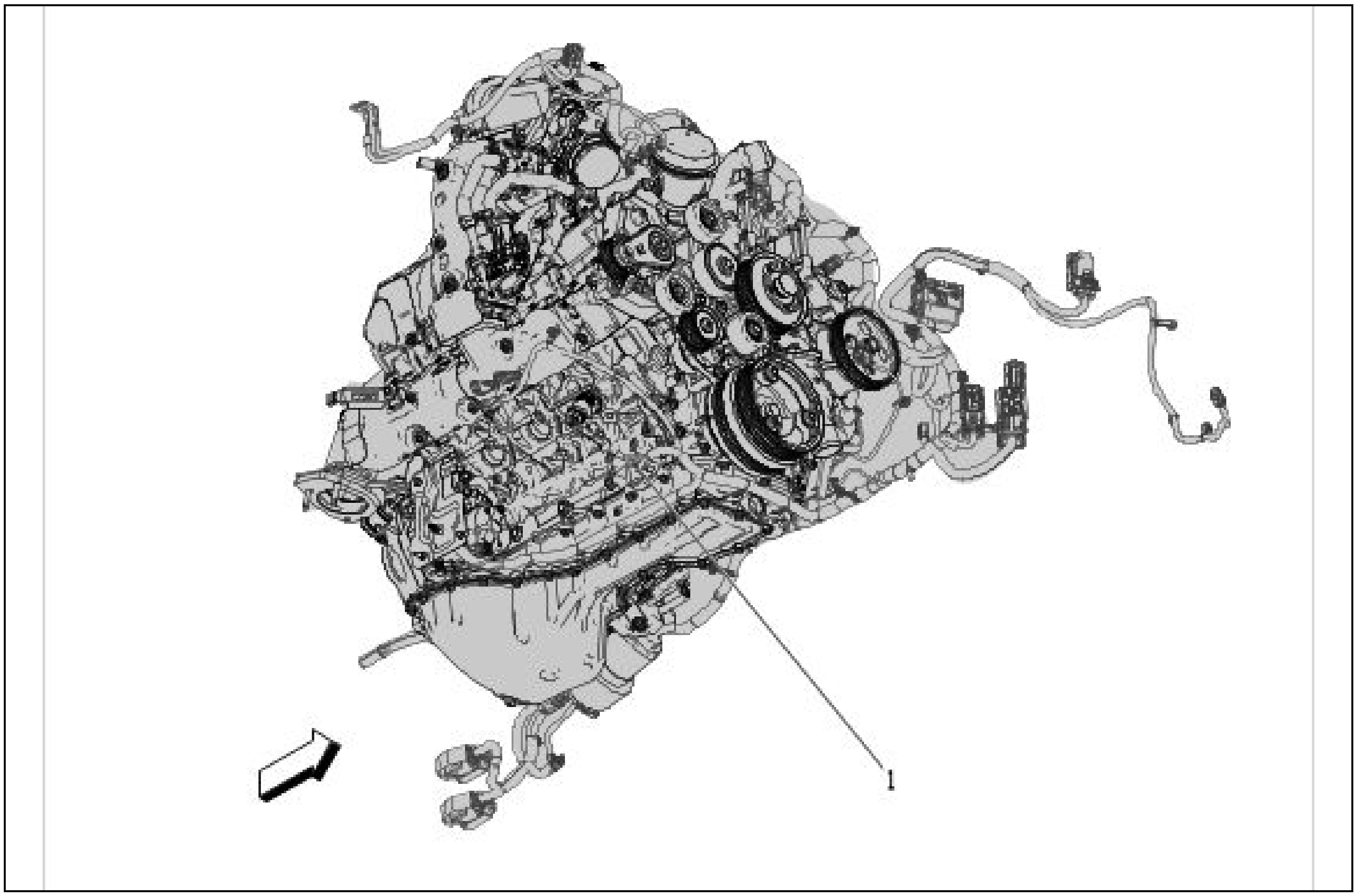
G177B (L8T)



6276739

Items
(1) G177B Engine Wiring Harness

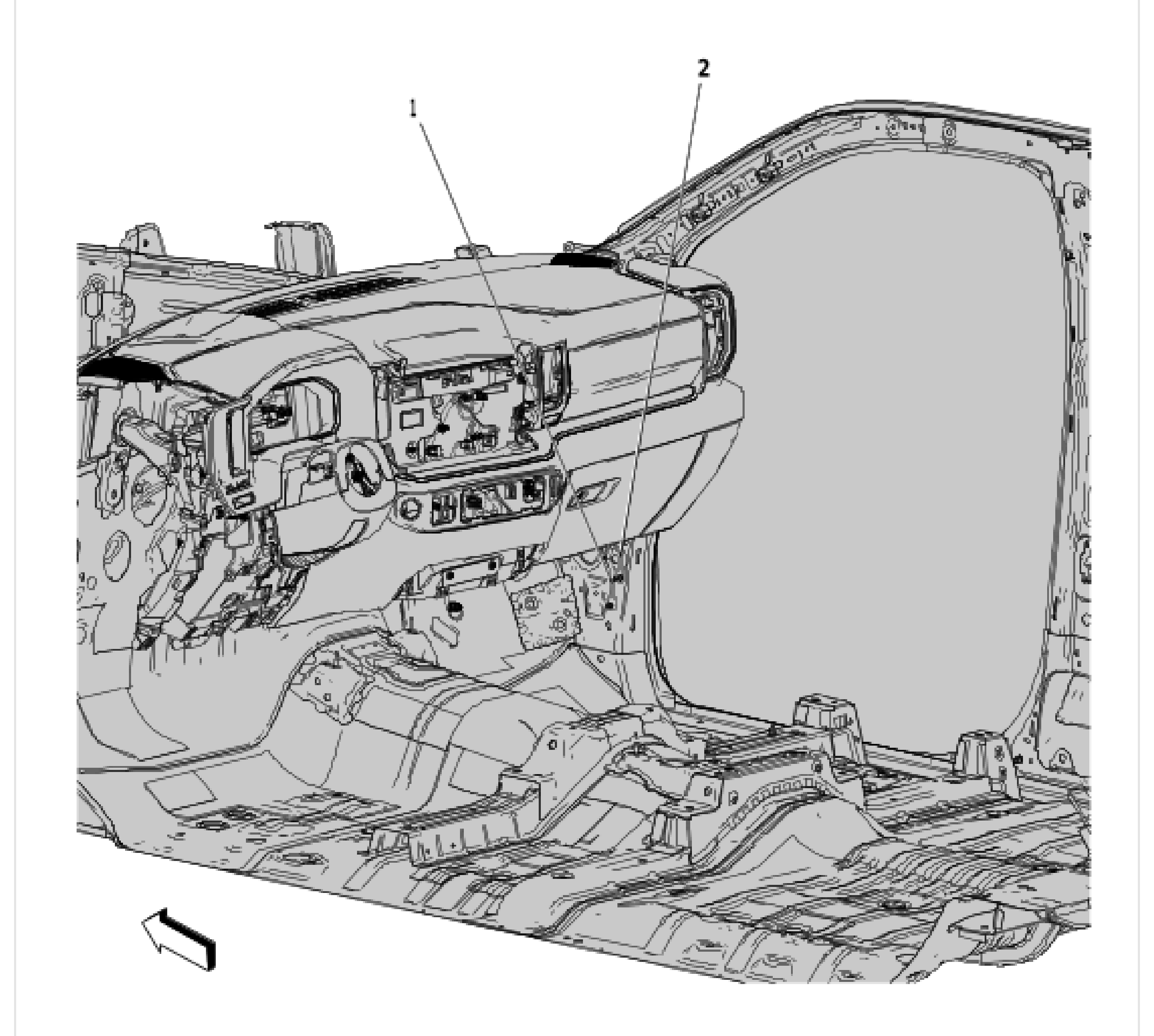
G177B (L5P)



6215830

Items
(1) G177B Engine Wiring Harness

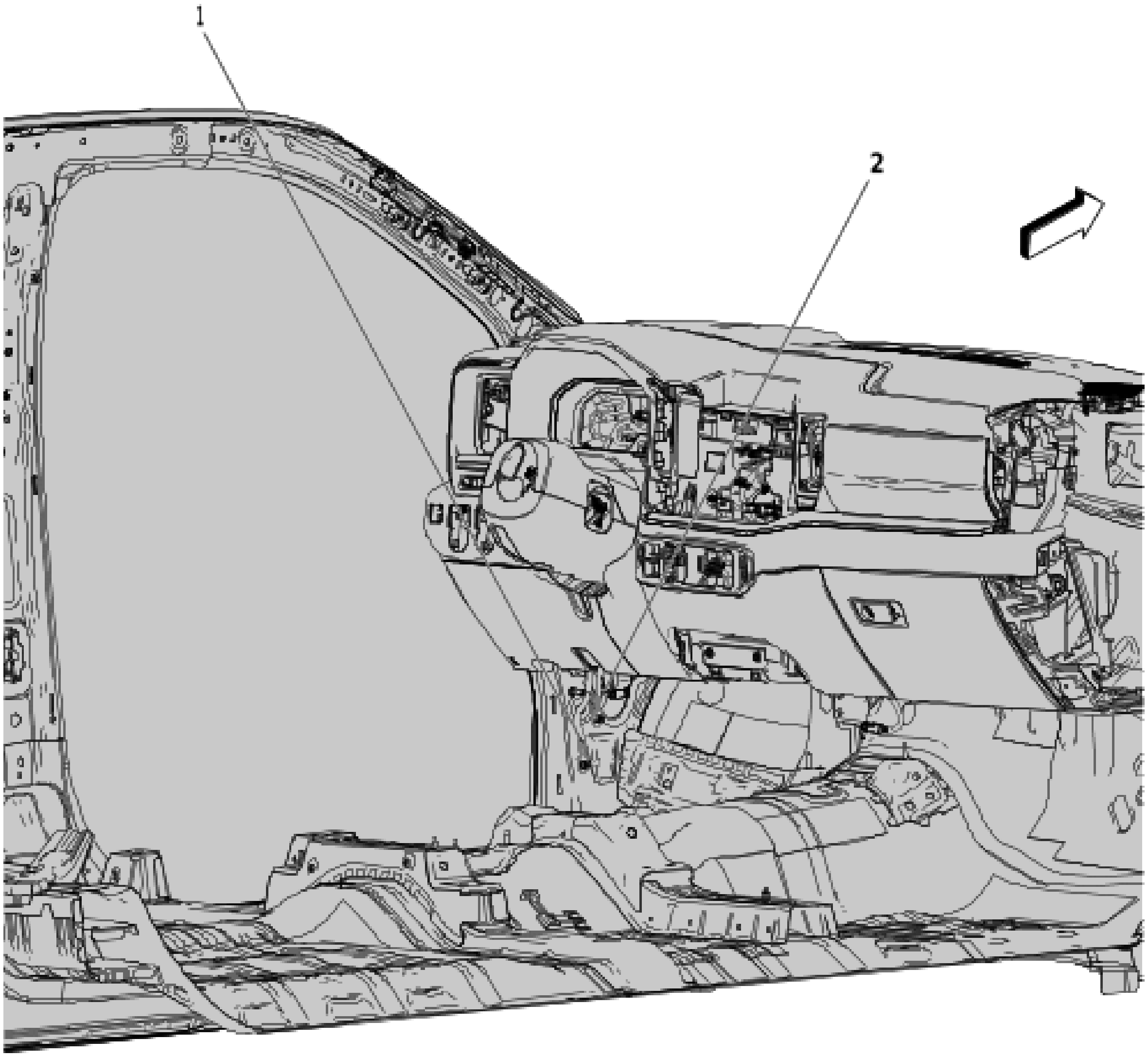
G200 and G202



6370950

Items
(1) G200 Instrument Panel Wiring Harness
(2) G202 Air Heater Ground Wiring Harness (C32)

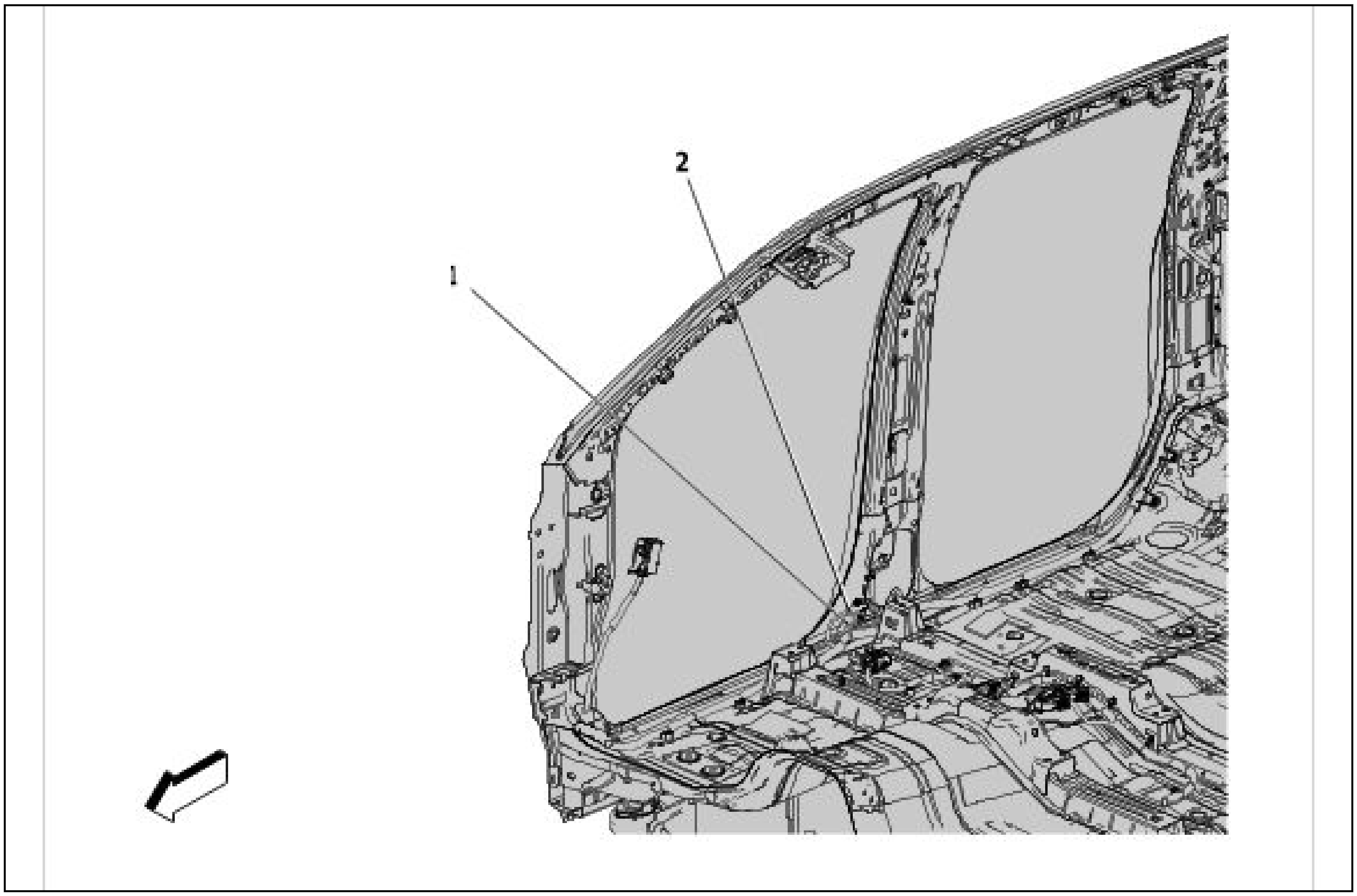
G201 and G203



6370958

Items
(1) G203 Air Heater Ground Wiring Harness (C32)
(2) G201 Instrument Panel Wiring Harness

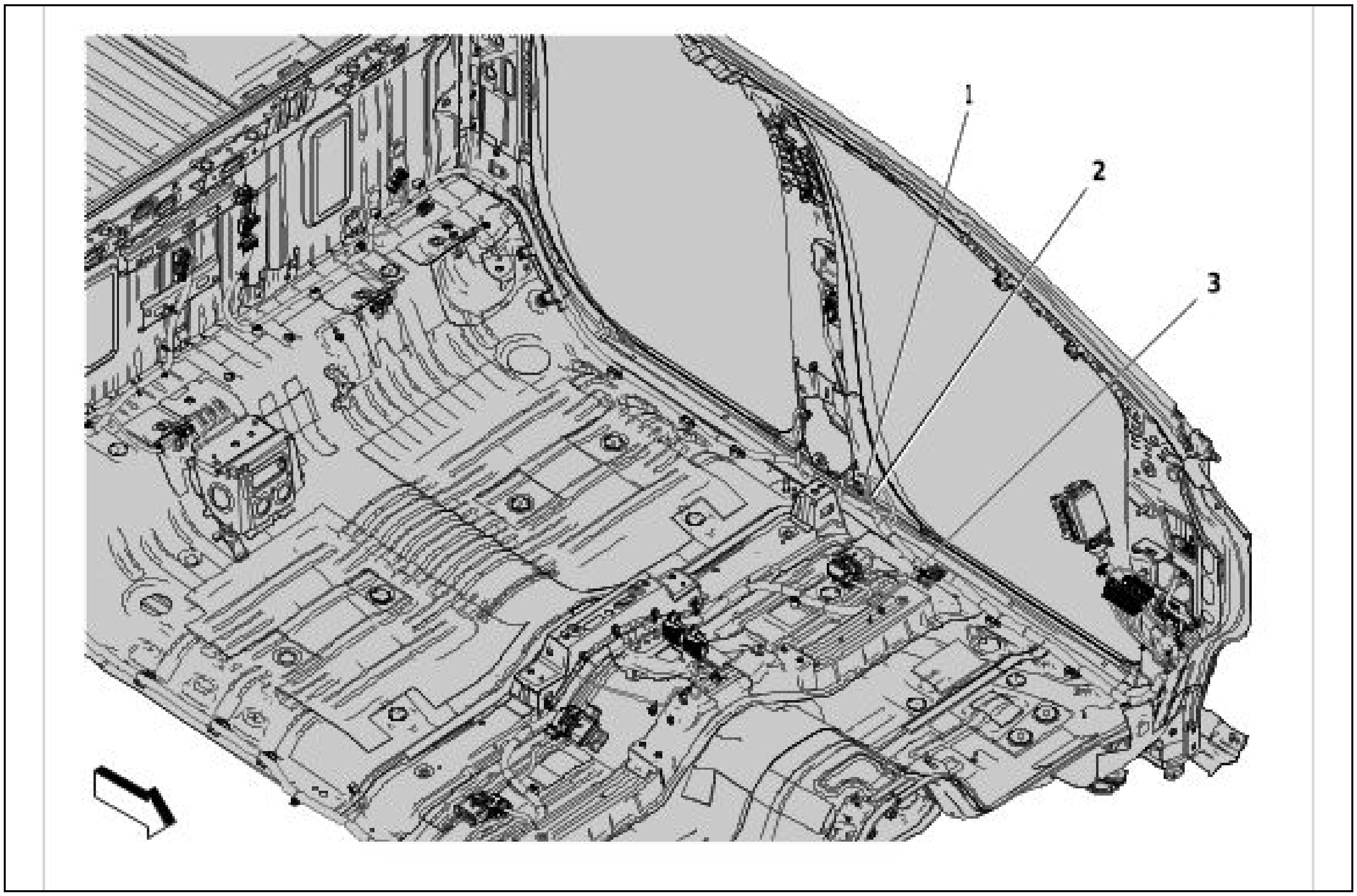
G300A and G300B - Double Cab/Crew Cab



6215836

Items
(1) G300A Body Wiring Harness
(2) G300B Body Wiring Harness

G301A, G301B and G303 - Double Cab/Crew Cab



6215838

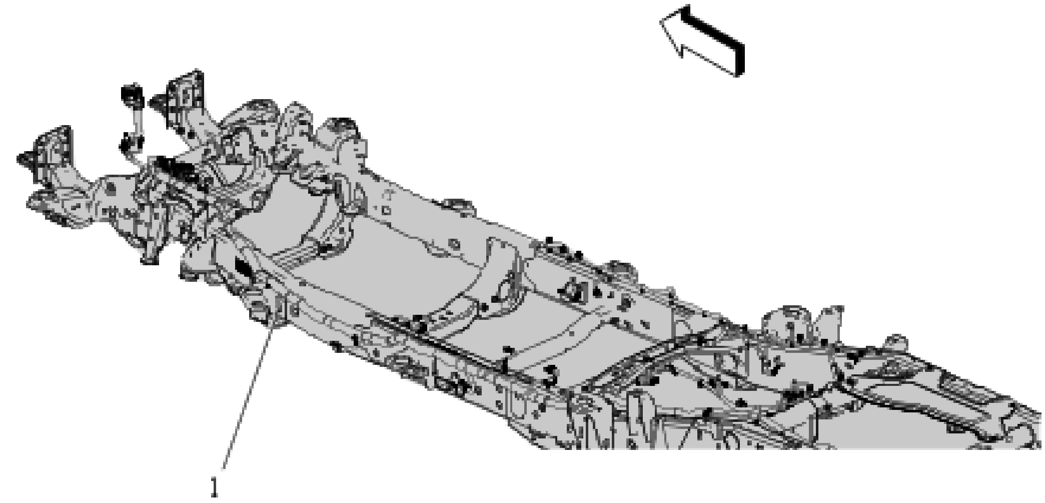
Items

(1) G301B Body Wiring Harness

(2) G301A Body Wiring Harness

(3) G303 Body Wiring Harness

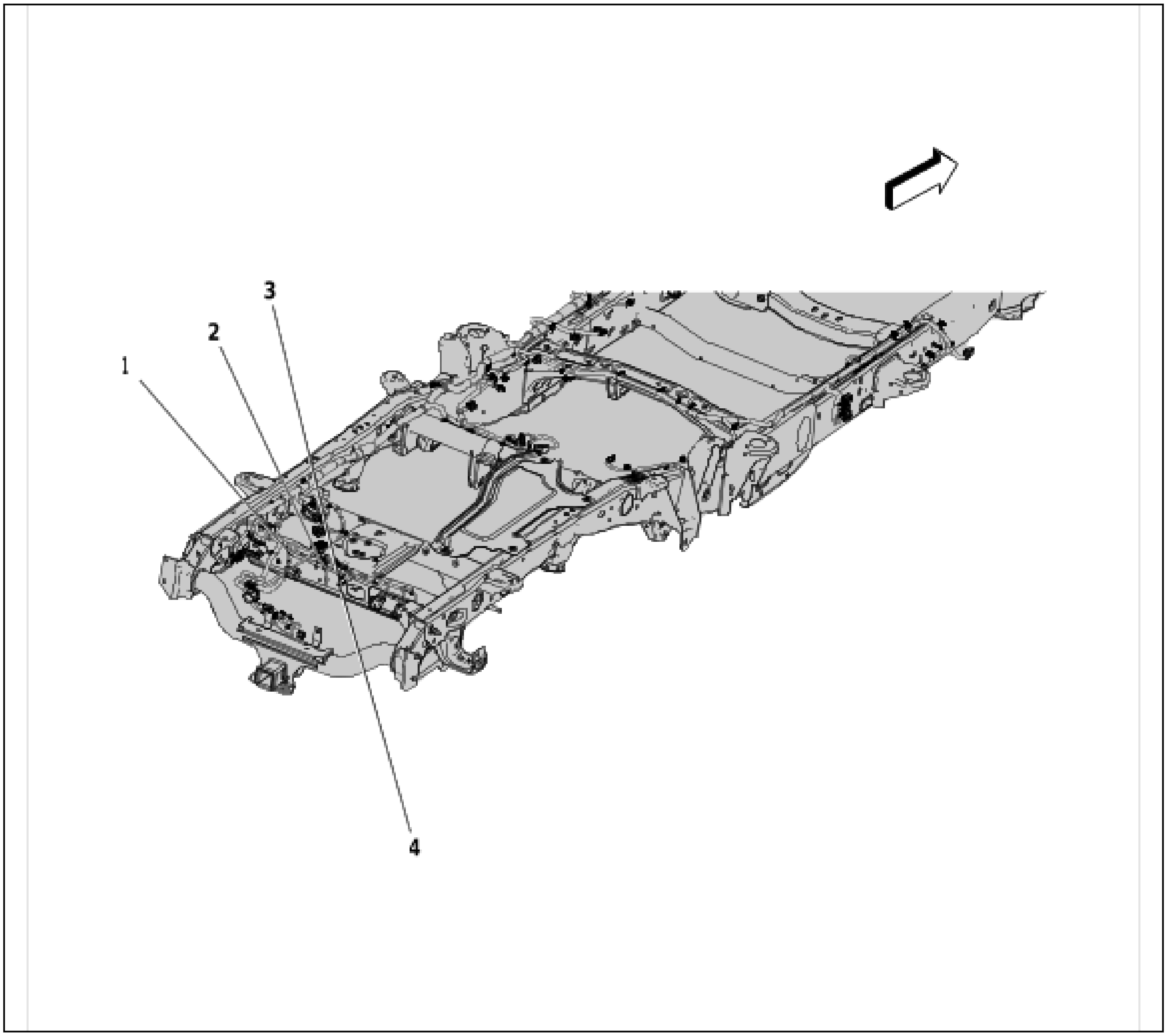
G402



6215839

Items
(1) G402 Chassis Wiring Harness

G404, G406A, G406B and G407



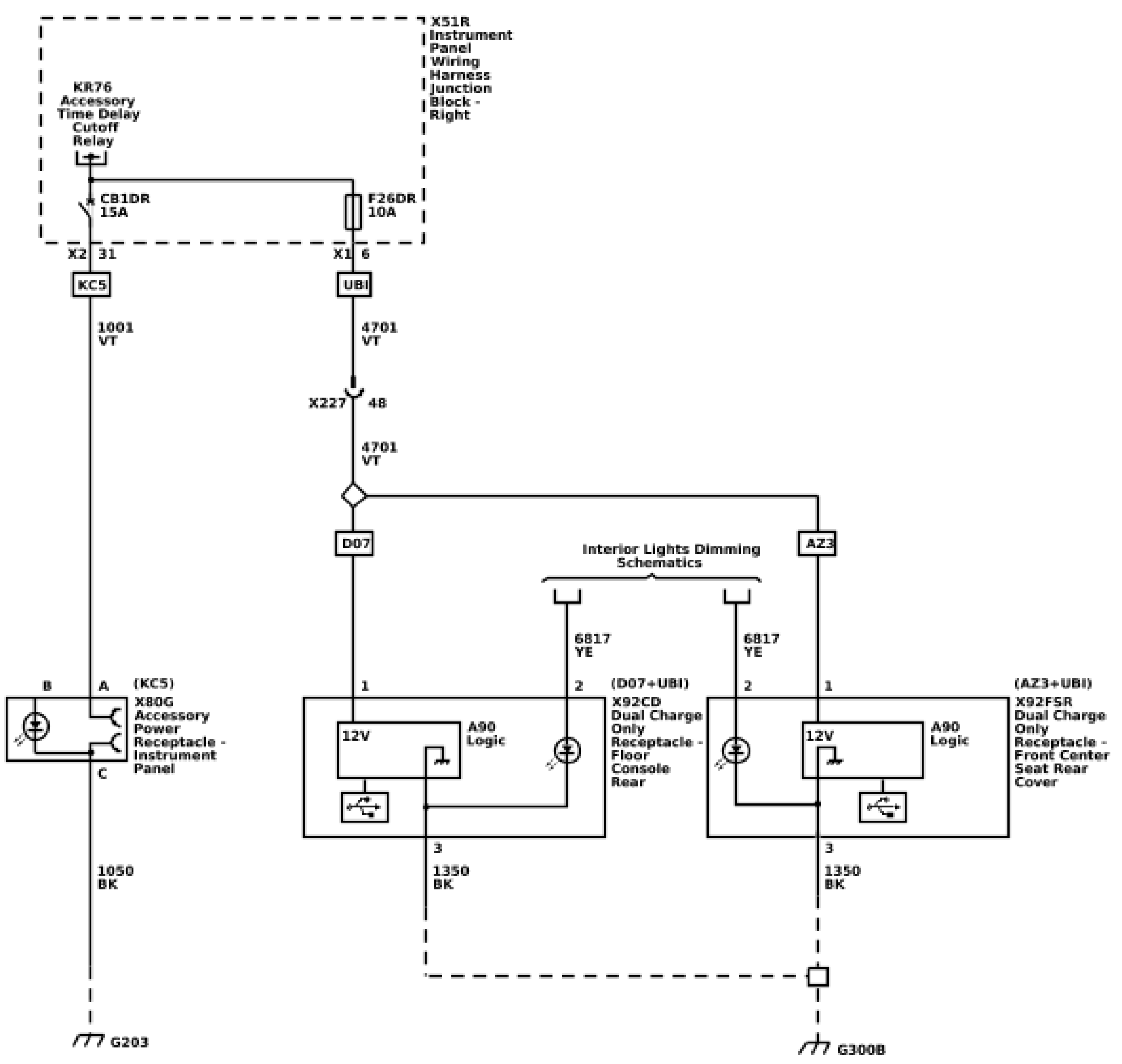
6215840

Items
(1) G407 Chassis Wiring Harness
(2) G404 Chassis Wiring Harness
(3) G406A Chassis Wiring Harness
(4) G406B Chassis Wiring Harness

Power Outlets

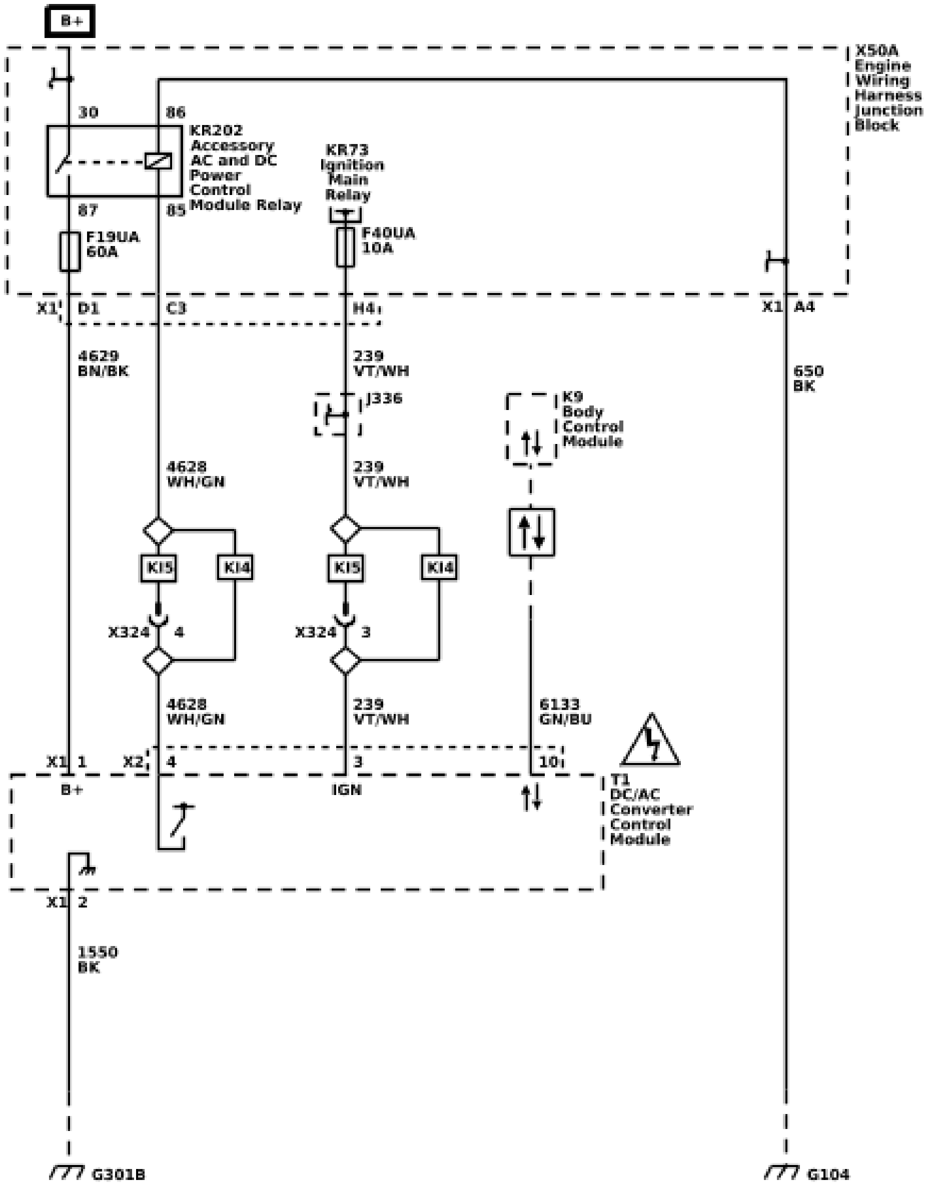
Schematic and Routing Diagrams

Cigar Lighter/Power Outlet Schematics (Power and Charge Receptacles)


X51R
Instrument Panel Wiring Harness Junction Block - Right
KR76
Accessory Time Delay Cutoff Relay
CB1DR
15A
F26DR
10A
X2 31
X1 6
KC5
UBI
1001
VT
4701
VT
X227 48
4701
VT
D07
AZ3
Interior Lights Dimming Schematics
6817
YE
6817
YE
B
A
C
(KC5)
X80G
Accessory Power Receptacle - Instrument Panel
1
2
3
12V
A90
Logic
(D07+UBI)
X92CD
Dual Charge Only Receptacle - Floor Console Rear
(AZ3+UBI)
X92FSR
Dual Charge Only Receptacle - Front Center Seat Rear Cover
1050
BK
1350
BK
1350
BK
G203
G300B

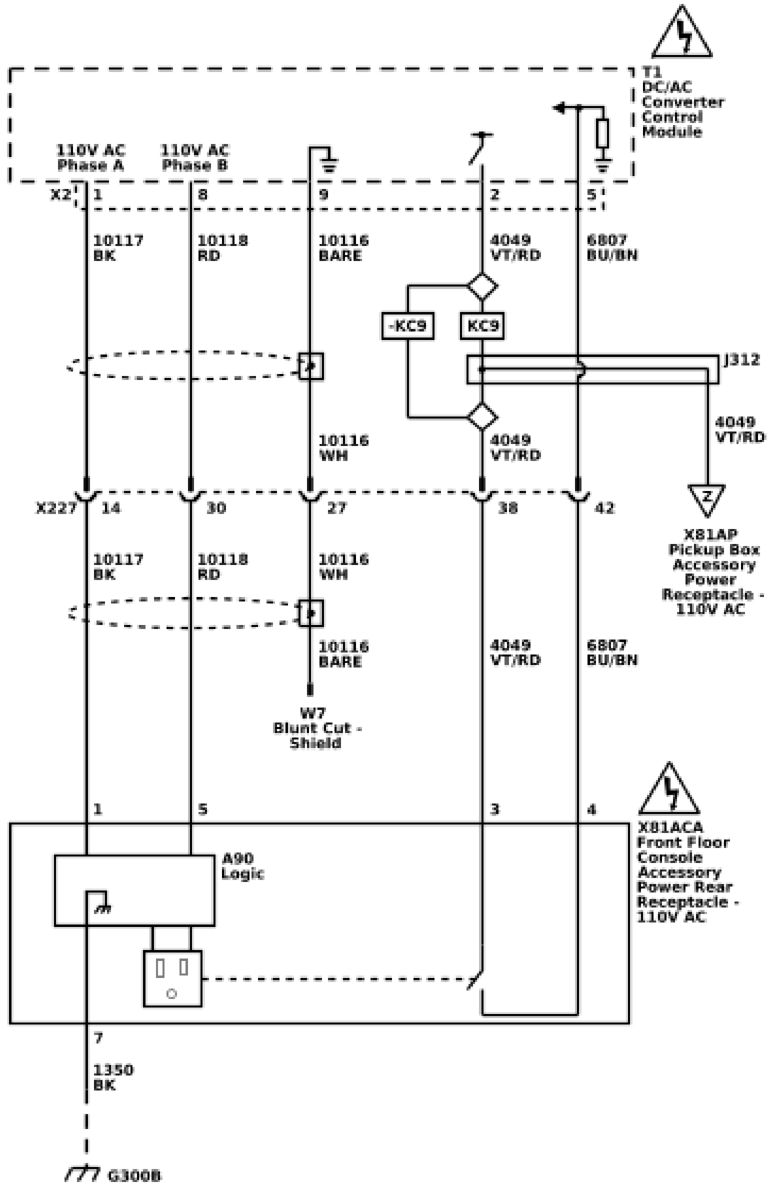
6846324

Cigar Lighter/Power Outlet Schematics (Inverter Module Power, Ground, and Serial Data)


B+
30
86
KR202 Accessory AC and DC Power Control Module Relay
87
85
F19UA 60A
KR73 Ignition Main Relay
F40UA 10A
X50A Engine Wiring Harness Junction Block
X1 D1
C3
H4
X1 A4
4629 BN/BK
239 VT/WH
J336
650 BK
K9 Body Control Module
4628 WH/GN
239 VT/WH
KI5
KI4
KI5
KI4
X324 4
X324 3
4628 WH/GN
239 VT/WH
6133 GN/BU
X1 1
X2 4
3
10
B+
IGN
T1 DC/AC Converter Control Module
X1 2
1550 BK
G301B
G104

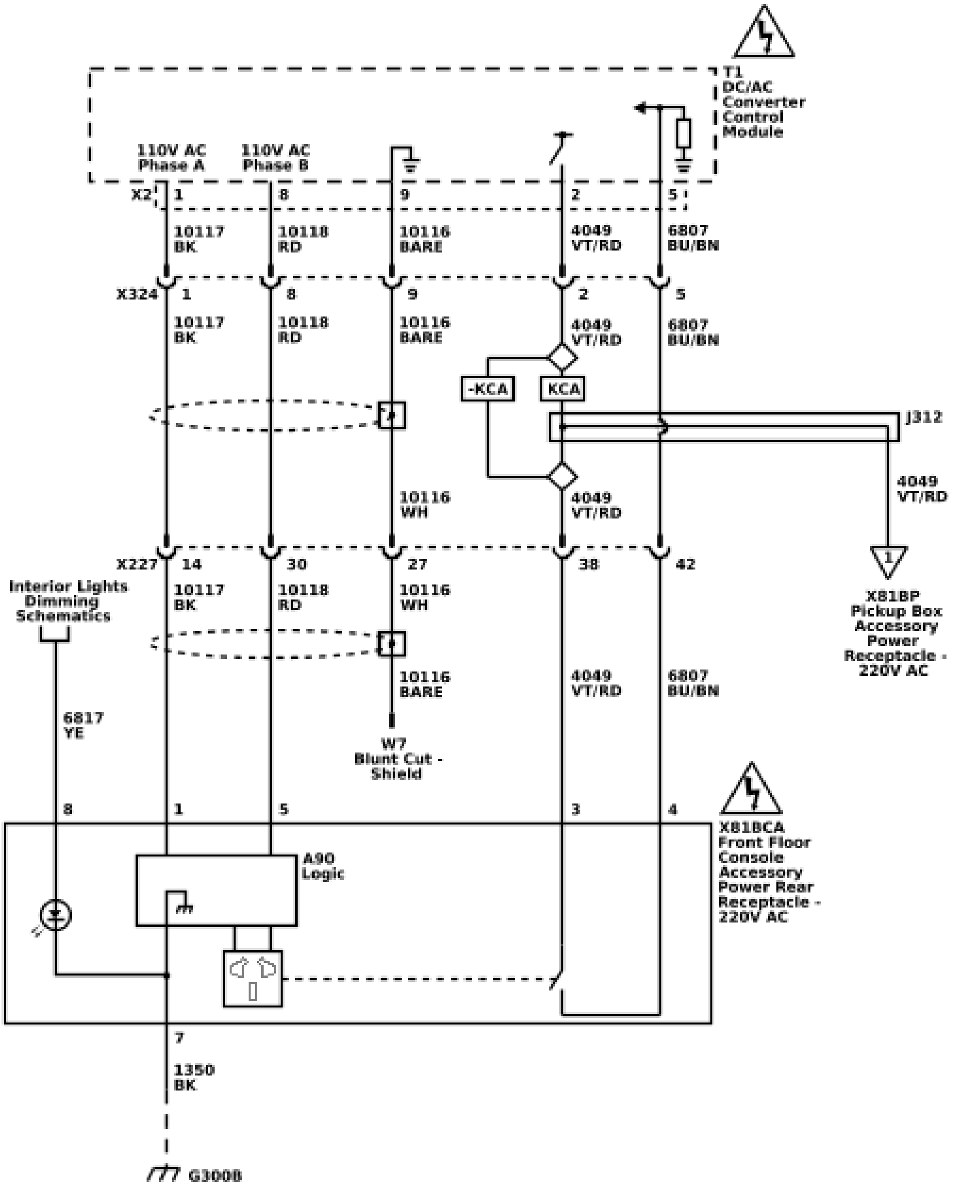
6846325

Cigar Lighter/Power Outlet Schematics (110V AC Accessory Power Rear Receptacle - Front Floor Console (KI4))


T1
DC/AC
Converter
Control
Module
110V AC
Phase A
110V AC
Phase B
X2
1
8
9
2
5
10117
BK
10118
RD
10116
BARE
4049
VT/RD
6807
BU/BN
-KC9
KC9
J312
10116
WH
4049
VT/RD
4049
VT/RD
Z
X81AP
Pickup Box
Accessory
Power
Receptacle -
110V AC
X227
14
30
27
38
42
10117
BK
10118
RD
10116
WH
10116
BARE
4049
VT/RD
6807
BU/BN
W7
Blunt Cut -
Shield
1
5
3
4
A90
Logic
X81ACA
Front Floor
Console
Accessory
Power Rear
Receptacle -
110V AC
7
1350
BK
G300B

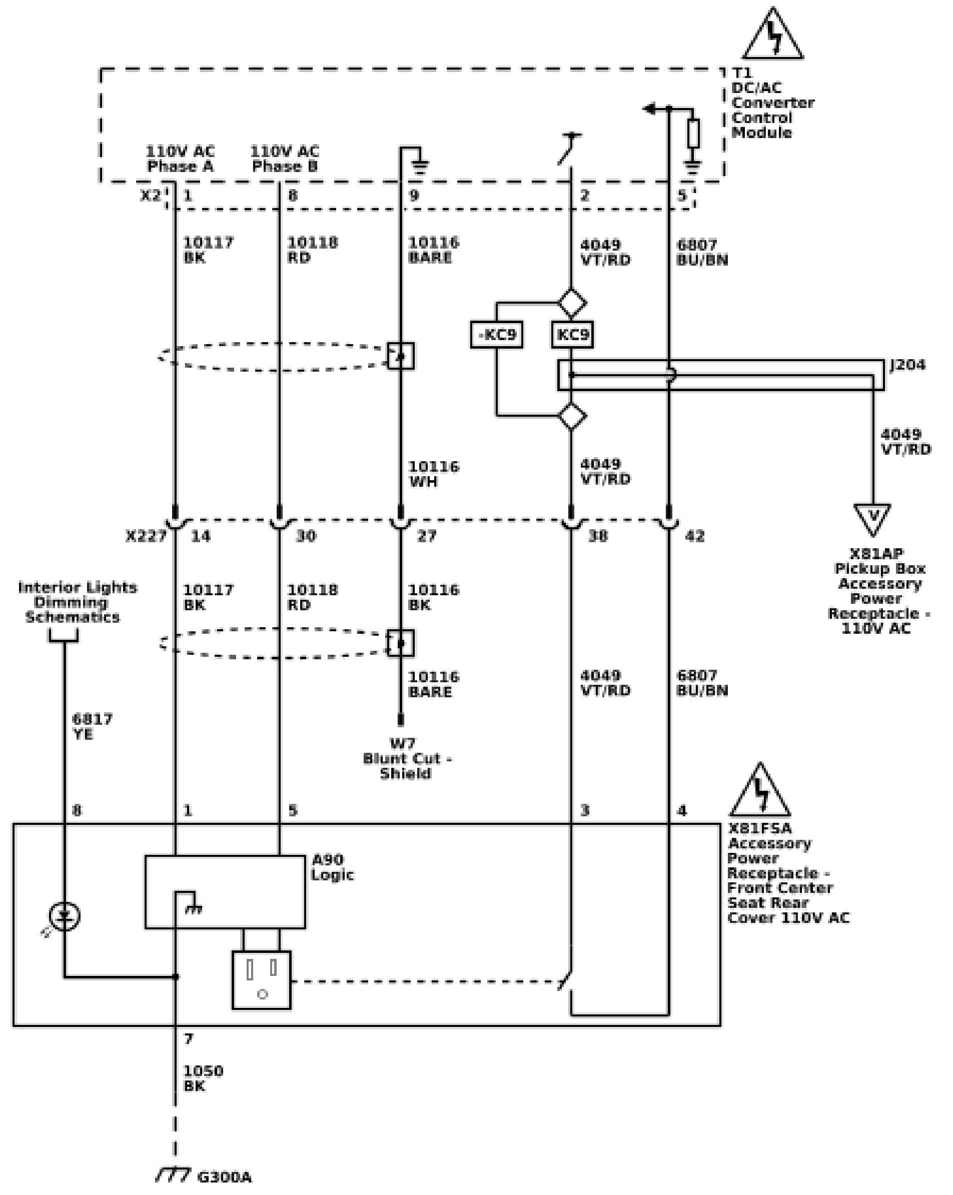
6846326

Cigar Lighter/Power Outlet Schematics (220V AC Accessory Power Rear Receptacle - Front Floor Console (KI5))


T1
DC/AC
Converter
Control
Module
110V AC
Phase A
110V AC
Phase B
X2
1
8
9
2
5
10117
BK
10118
RD
10116
BARE
4049
VT/RD
6807
BU/BN
X324
1
8
9
2
5
-KCA
KCA
J312
4049
VT/RD
10116
WH
X227
14
30
27
38
42
X81BP
Pickup Box
Accessory
Power
Receptacle -
220V AC
Interior Lights
Dimming
Schematics
6817
YE
W7
Blunt Cut -
Shield
8
1
5
3
4
X81BCA
Front Floor
Console
Accessory
Power Rear
Receptacle -
220V AC
A90
Logic
7
1350
BK
G300B

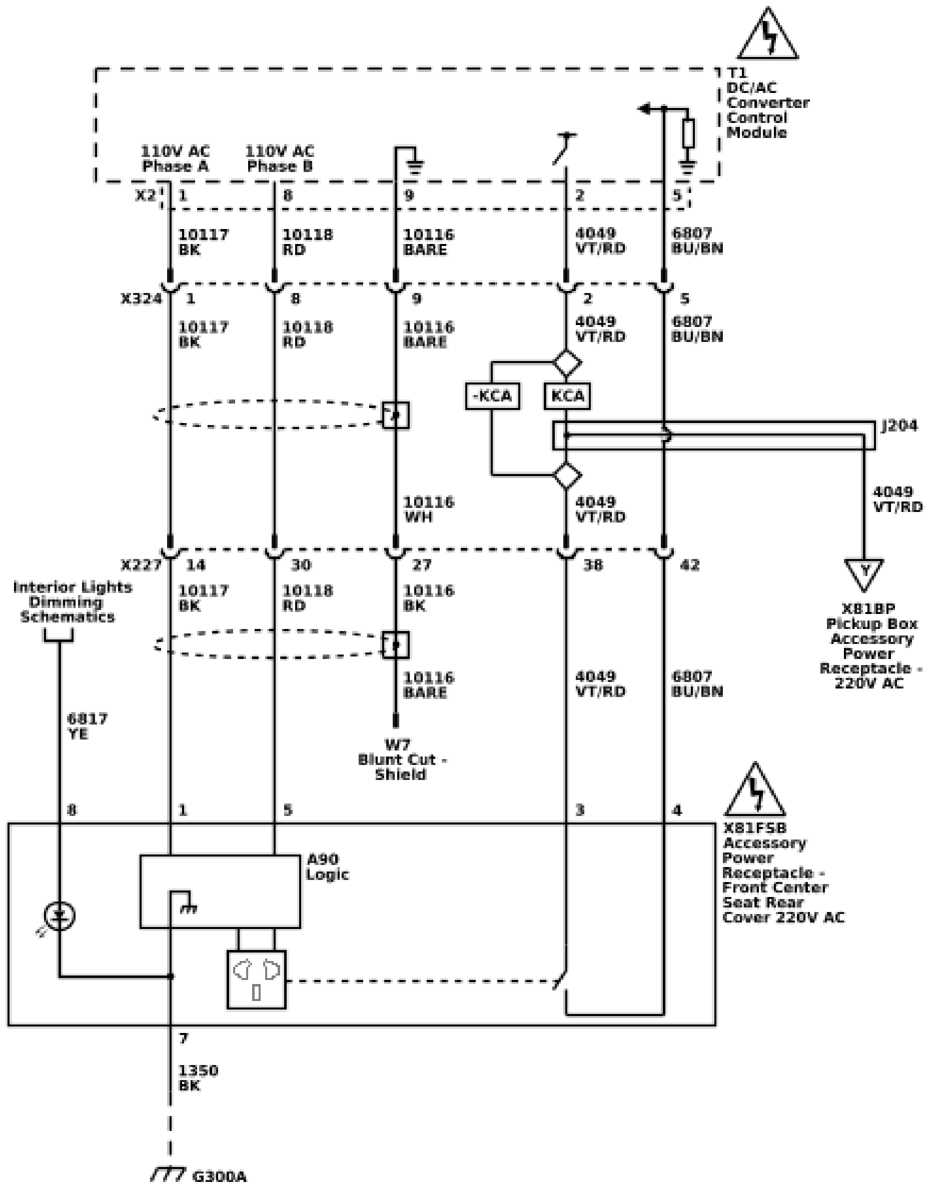
6846327

Cigar Lighter/Power Outlet Schematics (110V AC Accessory Power Receptacle - Front Center Seat Rear (KI4 & AZ3))


T1
DC/AC Converter Control Module
110V AC Phase A
110V AC Phase B
X2
1
8
9
2
5
10117 BK
10118 RD
10116 BARE
4049 VT/RD
6807 BU/BN
-KC9
KC9
J204
4049 VT/RD
X81AP Pickup Box Accessory Power Receptacle - 110V AC
10116 WH
4049 VT/RD
X227
14
30
27
38
42
Interior Lights Dimming Schematics
10117 BK
10118 RD
10116 BK
10116 BARE
4049 VT/RD
6807 BU/BN
6817 YE
W7 Blunt Cut - Shield
8
1
5
3
4
X81FSA Accessory Power Receptacle - Front Center Seat Rear Cover 110V AC
A90 Logic
7
1050 BK
G300A

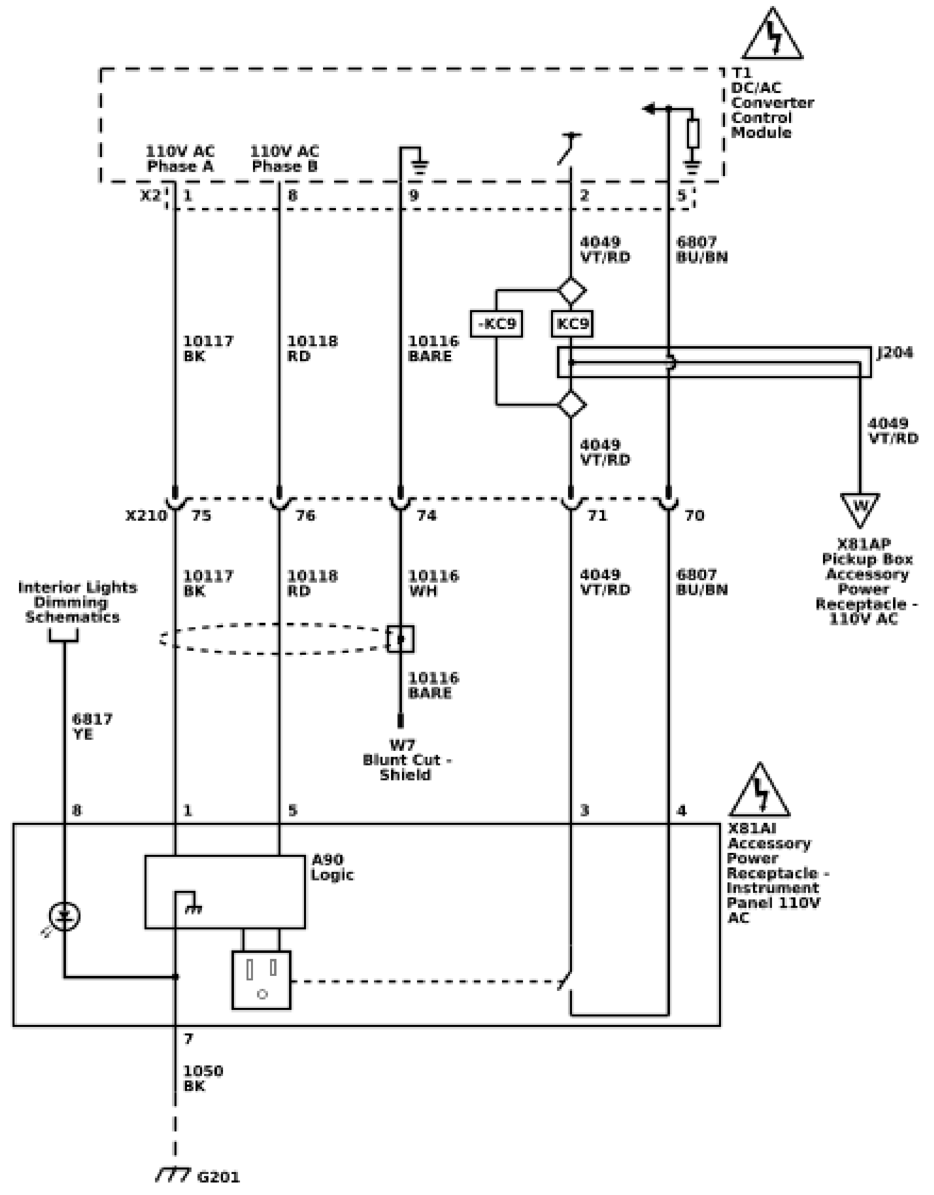
6846328

Cigar Lighter/Power Outlet Schematics (220V AC Accessory Power Receptacle - Front Center Seat Rear (KI5 & AZ3))


T1
DC/AC Converter Control Module
110V AC Phase A
110V AC Phase B
X2
1
8
9
2
5
10117 BK
10118 RD
10116 BARE
4049 VT/RD
6807 BU/BN
X324
-KCA
KCA
J204
10116 WH
4049 VT/RD
X227
14
30
27
38
42
Interior Lights Dimming Schematics
10117 BK
10118 RD
10116 BK
X81BP Pickup Box Accessory Power Receptacle - 220V AC
10116 BARE
6817 YE
W7 Blunt Cut - Shield
8
1
5
3
4
A90 Logic
X81F5B Accessory Power Receptacle - Front Center Seat Rear Cover 220V AC
7
1350 BK
G300A

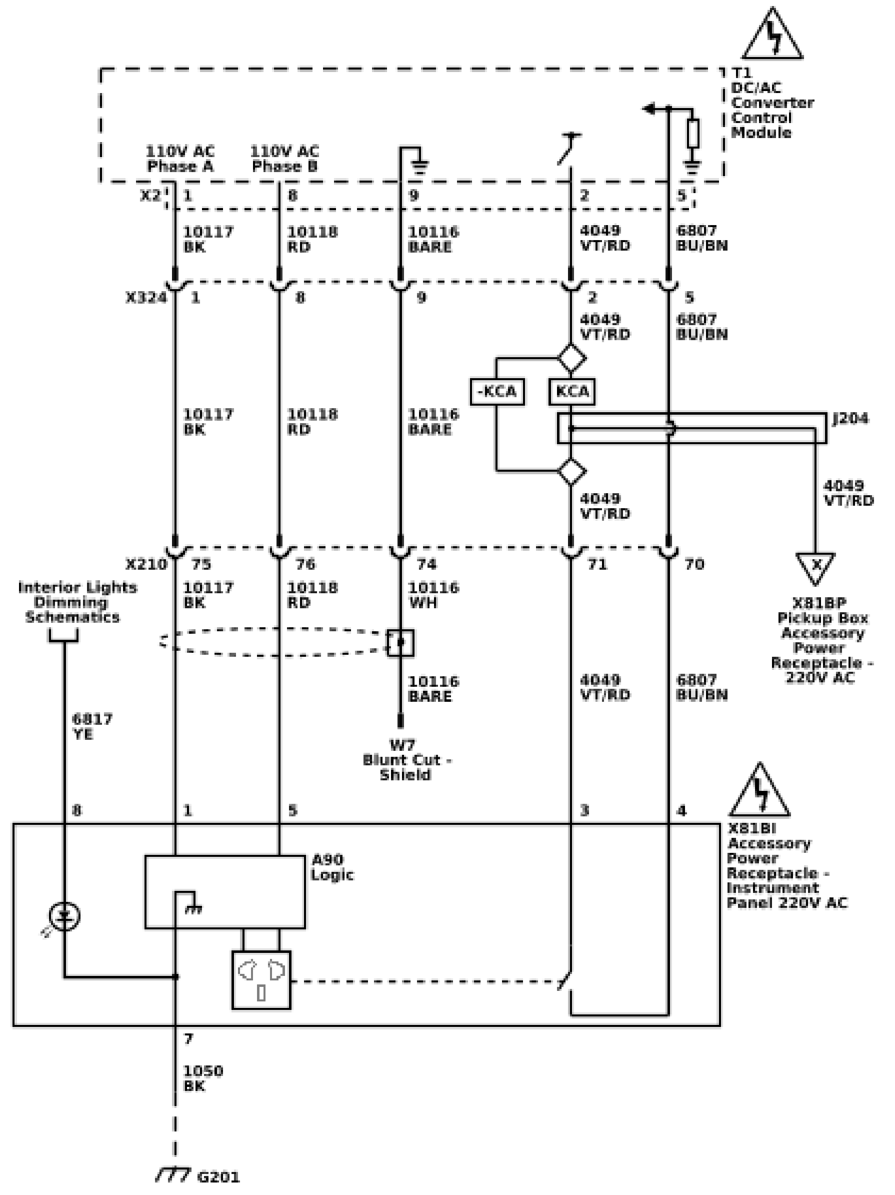
6846329

Cigar Lighter/Power Outlet Schematics (110V AC Accessory Power Receptacle - Instrument Panel (KI4 - (AZ3 / D07)))


T1
DC/AC
Converter
Control
Module
110V AC
Phase A
110V AC
Phase B
X2
1
8
9
2
5
4049
VT/RD
6807
BU/BN
-KC9
KC9
J204
10117
BK
10118
RD
10116
BARE
4049
VT/RD
4049
VT/RD
X210
75
76
74
71
70
W
X81AP
Pickup Box
Accessory
Power
Receptacle -
110V AC
Interior Lights
Dimming
Schematics
10117
BK
10118
RD
10116
WH
4049
VT/RD
6807
BU/BN
10116
BARE
6817
YE
W7
Blunt Cut -
Shield
8
1
5
3
4
X81AI
Accessory
Power
Receptacle -
Instrument
Panel 110V
AC
A90
Logic
7
1050
BK
G201

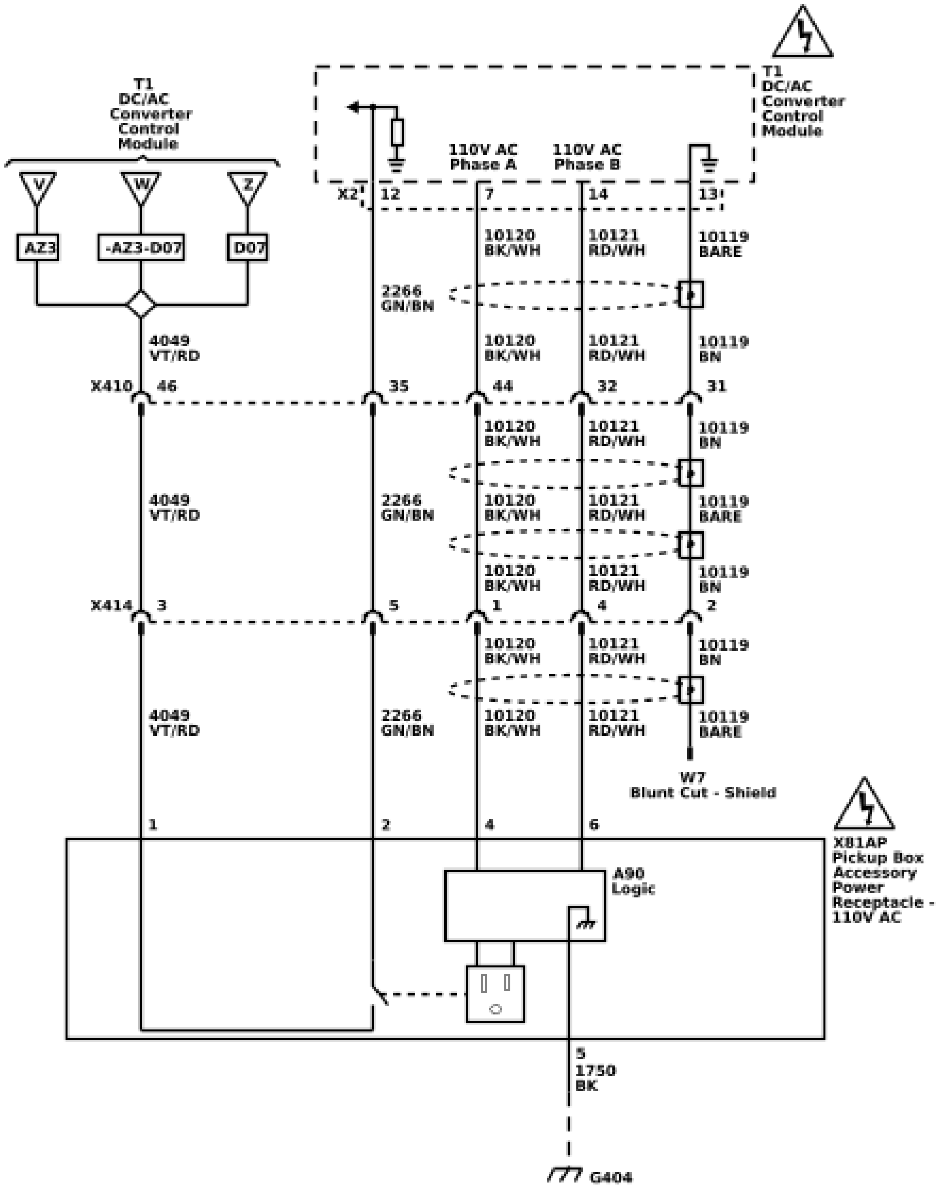
6846330

Cigar Lighter/Power Outlet Schematics (220V AC Accessory Power Receptacle - Instrument Panel (KI5 - (AZ3 / D07)))


T1
DC/AC Converter Control Module
110V AC Phase A
110V AC Phase B
X2
1
8
9
2
5
10117 BK
10118 RD
10116 BARE
4049 VT/RD
6807 BU/BN
X324
-KCA
KCA
J204
4049 VT/RD
X210
75
76
74
71
70
Interior Lights Dimming Schematics
10117 BK
10118 RD
10116 WH
X81BP Pickup Box Accessory Power Receptacle - 220V AC
10116 BARE
4049 VT/RD
6807 BU/BN
6817 YE
W7 Blunt Cut - Shield
8
1
5
3
4
X81BI Accessory Power Receptacle - Instrument Panel 220V AC
A90 Logic
7
1050 BK
G201

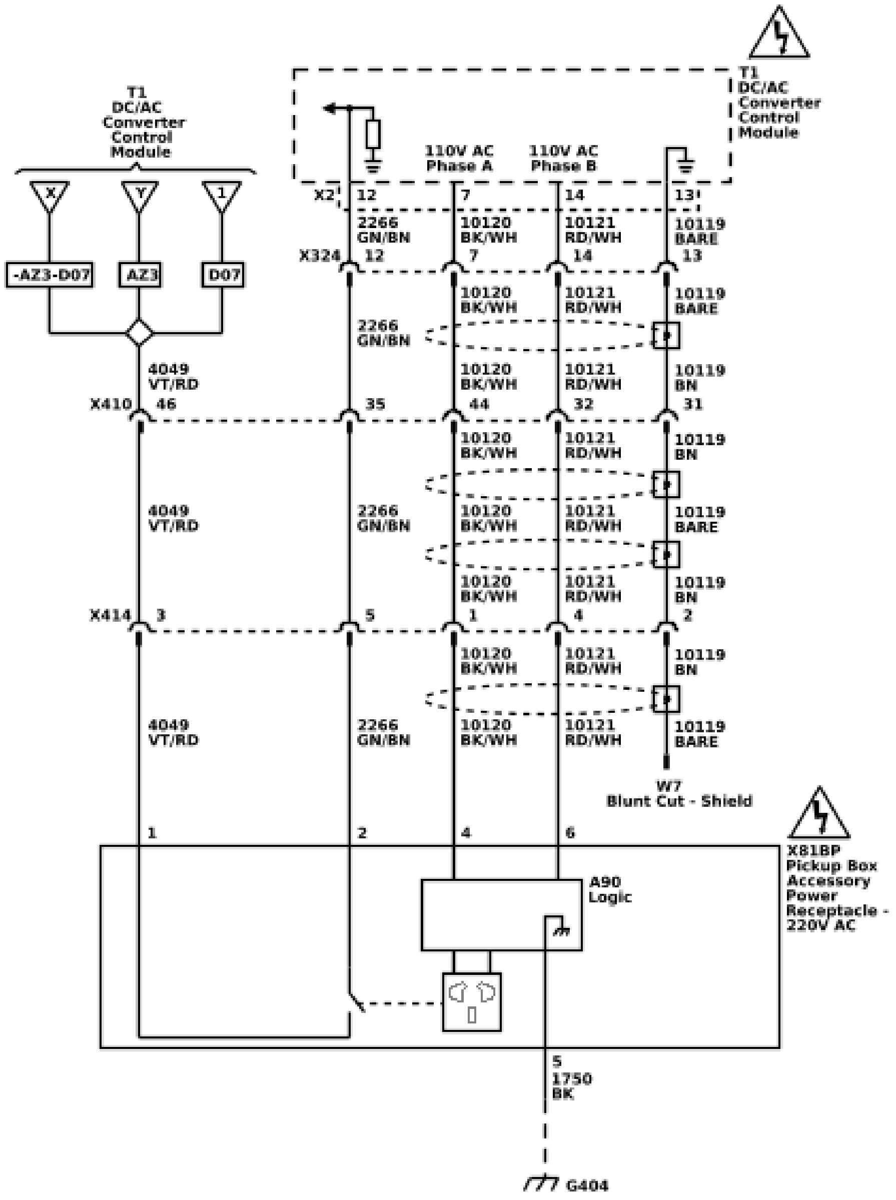
6846331

Cigar Lighter/Power Outlet Schematics (110V AC Pickup Box Accessory Power Receptacle (KC9))

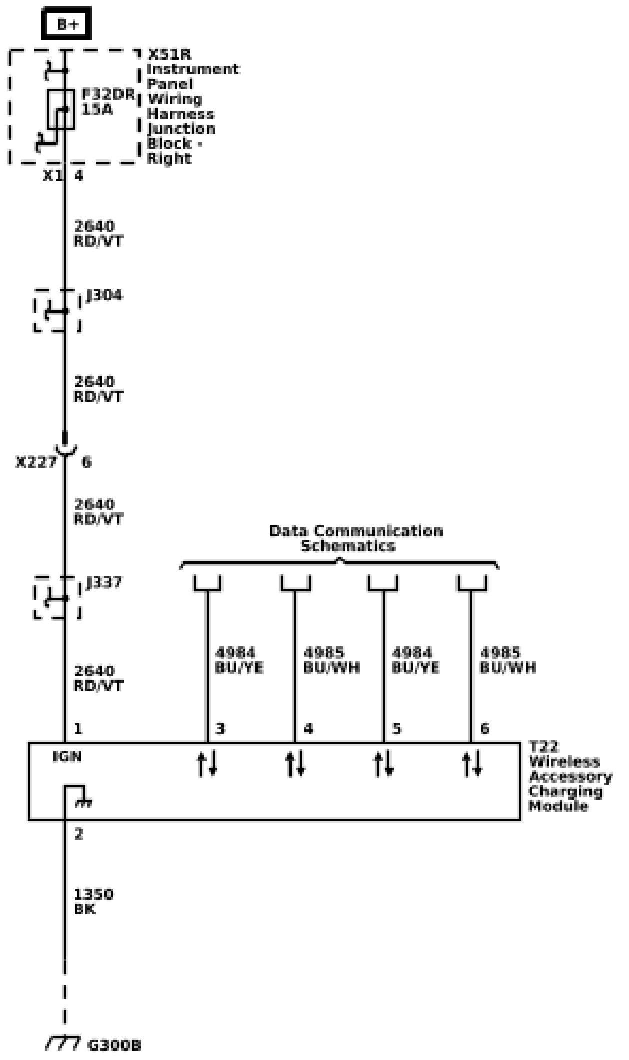

T1
DC/AC
Converter
Control
Module
V
W
Z
AZ3
-AZ3-D07
D07
4049
VT/RD
X410
46
35
44
32
31
X2
12
7
14
13
110V AC
Phase A
110V AC
Phase B
2266
GN/BN
10120
BK/WH
10121
RD/WH
10119
BARE
10119
BN
X414
3
5
1
4
2
W7
Blunt Cut - Shield
6
A90
Logic
X81AP
Pickup Box
Accessory
Power
Receptacle -
110V AC
5
1750
BK
G404

6846332

Cigar Lighter/Power Outlet Schematics (220V AC Pickup Box Accessory Power Receptacle (KCA))


T1
DC/AC
Converter
Control
Module
X
Y
1
-AZ3-D07
AZ3
D07
4049
VT/RD
X410 46
X414 3
1
T1
DC/AC
Converter
Control
Module
X2 12
7
14
13
110V AC
Phase A
110V AC
Phase B
2266
GN/BN
10120
BK/WH
10121
RD/WH
10119
BARE
X324 12
7
14
13
10119
BN
35
44
32
31
5
1
4
2
W7
Blunt Cut - Shield
2
4
6
A90
Logic
X81BP
Pickup Box
Accessory
Power
Receptacle -
220V AC
5
1750
BK
G404
6846333

Cigar Lighter/Power Outlet Schematics (Wireless Charging (K4C))


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F32DR 15A
X1 4
2640 RD/VT
J304
2640 RD/VT
X227 6
2640 RD/VT
J337
2640 RD/VT
Data Communication Schematics
4984 BU/YE
4985 BU/WH
4984 BU/YE
4985 BU/WH
1
3
4
5
6
IGN
T22 Wireless Accessory Charging Module
2
1350 BK
G300B

6846334

Description and Operation

Mobile Device Wireless Charger Description and Operation

Mobile Device Wireless Charging System

The Mobile Device Wireless Charging System (WCS) is an system for wirelessly charging mobile devices. It is capable of charging the batteries of compatible mobile devices. A compatible device is one that is compliant with Power Matters Alliance (PMA), Wireless Power Consortium (WPC) Standard, or Alliance for Wireless Power (A4WP), meaning that it is equipped with a PMA, WPC, or A4WP wireless charge “receiver” that will work with the charge “transmitter” installed in the vehicle. The devices may utilize built-in charging circuitry or an adapter (external plug-in device which contains the charging circuitry). To check for phone or other device compatibility, refer to GM Total Connect.

Warning: Remove all objects from the charging pad before charging your mobile device. Objects, such as coins, keys, rings, paper clips, or cards, between the phone and charging pad will become very hot. On the rare occasion that the charging system does not detect an object, and the object gets wedged between the phone and charger, remove the phone and allow the object to cool before removing it from the charging pad, to prevent burns.

Charging

To charge a device, place it on the charging surface in the vehicle. There is a charging coil located in the center of the charging surface. The device has a charging coil typically near the center of the device. These coils must be lined up in order for charging to proceed. When the interruptible retained accessory power (IRAP) relay is closed (this is true typically when vehicle ignition is in Run or Accessory position), the WCS will detect the device, establish communications with the device to confirm it is a compatible device, and then deliver charging power to the device via wireless interface. The WCS will be able to deliver 5W to 15W of power as requested by the compatible device. It shall only enter a charging state if communication is established and a compatible device is identified.

The WCS shall not enter a charging state if there is no communication established with a compatible device. Due to differences in objects, a foreign object detection protocol is employed to detect a non-compliant device and hold power transfer initiation until the non-compliant object has been removed and a compliant object has been detected. The charger monitors its internal temperature and will shut down if the charger temperature exceeds 185F (85C).

Indicator

The K9 Body Control Module will detect the device battery is charging and send a serial data message on the GMLAN bus to the radio display. The radio display will indicate a device is currently charging by displaying a lightning bolt over the phone icon. When the indicator is toggling on and off this indicates a thermal limit has been reached and the device will not charge. For more information refer to the owners manual.

Cooling

The Wireless Charge modules (WCM) have a fan on the bottom of the module. When the WCM charges, it simply pulls or pushes air from the phone, through the vents in the rubber liner, over the module, and down into the center console.

Power Outlets Description and Operation

12 Volt Power Outlet Receptacle Description and Operation

The 12 V accessory power receptacles are supplied with power by the accessory relay.

The vehicle is fitted with a cigarette lighter and/or with a 12 V accessory power receptacle. The cigarette lighter and accessory power outlets are controlled by an ignition operated relay. The accessory power receptacle and cigarette lighter are operational when the ignition is turned to either the On or the Accessories positions. To operate the cigarette lighter, press in the lighter knob. When the element is hot, the lighter automatically pops out and is ready for use.

110 Volt Power Outlet Receptacle System Description

The alternating current (AC) accessory power outlet system consists of the accessory DC/AC power inverter module and the accessory power receptacle – 110 V AC. The accessory DC/AC power inverter module converts 12 V direct current (DC) battery power to 110 V at 60 Hertz (Hz) AC power to operate AC powered devices. The accessory DC/AC power inverter module provides up to 400 watts of power. The accessory power receptacle – 110 V AC provides the usual connection for AC powered devices.

110 Volt Power Outlet Receptacle System Operation

The accessory DC/AC power inverter module receives fuse protected battery voltage and is connected to the 12 V electrical system ground. The accessory power receptacle – 110 V AC has an internal switch, that detects when an AC powered device is plugged into the outlet. When the ignition is ON, and an AC powered device is plugged into the accessory power receptacle – 110 V AC, the normally open switch in the accessory power receptacle – 110 V AC, closes. When the accessory DC/AC power inverter module detects the voltage from the accessory power receptacle – 110 V AC switch, the inverter module begins to supply 110 V AC to the accessory power receptacle – 110 V AC after a 1.5 s delay. The accessory AC power system is protected against circuit overload and circuit shorts to ground.

110 Volt Power Outlet Receptacle Isolation Fault Protection

The accessory DC/AC power inverter module contains a ground fault circuit interrupter (GFCI). GFCI monitors the 110 V circuit for a short to vehicle chassis ground. If a 110 V AC short to ground is detected, the accessory DC/AC power inverter module will turn OFF. The module remains OFF, until the AC powered device is unplugged from the outlet, and then plugged into the outlet after a 3 s delay.

110 Volt Power Outlet Receptacle Overload Shutdown

The accessory DC/AC power inverter module will turn OFF if the current in the 110 V circuit is greater than 3.8 A for 1 s , or 2.5 A for 10 s . The module will turn ON again, when the AC powered device is unplugged from the outlet, and then plugged into the outlet after a 3 s delay.

110 Volt Power Outlet Receptacle Internal Shutdown

The accessory DC/AC power inverter module will turn OFF if the B+ supply voltage is greater than 16.5 V or less than 11 V. The module will also turn OFF if the device temperature is greater than 85°C (185°F). The module will turn ON again, after the shutdown condition is corrected, and the AC powered device is unplugged from the outlet, and then plugged into the outlet.

230 Volt Power Outlet Receptacle System Description

The alternating current (AC) accessory power outlet system consists of the accessory DC/AC power inverter module and the accessory power receptacle – 220V AC. The accessory DC/AC power inverter module converts 12 V direct current (DC) battery power to 220–230 V at 50 Hertz (Hz) AC power to operate AC powered devices. The accessory DC/AC power inverter module provides up to 400 watts of power. The accessory power receptacle – 220V AC provides the usual connection for AC powered devices.

230 Volt Power Outlet Receptacle System Operation

The accessory DC/AC power inverter module receives fuse protected battery voltage and is connected to the 12 V electrical system ground. The accessory power receptacle – 220V AC has an internal switch, that detects when an AC powered device is plugged into the outlet. When the ignition is ON, and an AC powered device is plugged into the accessory power receptacle – 220V AC, the normally open switch in the accessory power receptacle – 220V AC, closes. When the accessory DC/AC power inverter module detects the voltage from the accessory power receptacle – 220V AC switch, the inverter module begins to supply 220–230 V AC to the accessory power receptacle – 220V AC after a 1.5 second delay. The accessory AC power system is protected against circuit overload and circuit shorts to ground.

230 Volt Power Outlet Receptacle Isolation Fault Protection

The accessory DC/AC power inverter module contains a ground fault circuit interrupter (GFCI). GFCI monitors the 230 V circuit for a short to vehicle chassis ground. If a 230 V AC short to ground is detected, the accessory DC/AC power inverter module will turn OFF. The module remains OFF, until the AC powered device is unplugged from the outlet, and then plugged into the outlet after a 3 s delay.

230 Volt Power Outlet Receptacle Overload Shutdown

The accessory AC/DC power control module will turn OFF if the current in the 230 V circuit is greater than 3.8 A for 1 second, or 2.5 A for 10 seconds. The module will turn ON again, when the AC powered device is unplugged from the outlet, and then plugged into the outlet after a 3 second delay.

230 Volt Power Outlet Receptacle Internal Shutdown

The accessory DC/AC power inverter module will turn OFF if the B+ supply voltage is greater than 16.5 V or less than 11 V. The module will also turn OFF if the device temperature is greater than 85°C (185°F). The module will turn ON again, after the shutdown condition is corrected, and the AC powered device is unplugged from the accessory power receptacle – 220V AC, and then plugged into the accessory power receptacle – 220V AC.

USB Receptacle Description and Operation (USS)

The vehicle is fitted with USB charge port receptacles. These USB receptacles are for charging devices only. The USB receptacles are controlled by an ignition operated relay and are operational when the ignition is turned to either the On or the Accessories positions.

Wiring Systems and Power Management

Schematic and Routing Diagrams

How to Use Electrical Schematics

Information Overview

The following explains some of the key parts of the GM wiring diagrams. Included are:

- Color Abbreviations
- Electronic Delivery Navigation Features

Color Abbreviations

The following sequence is used when depicting wire colors:

1. Color modifier of the wire, such as light or dark (if applicable)
2. Primary color of the wire
3. Secondary color of the wire (tracer/stripe)

Wire insulation and connector body colors in schematic information are abbreviated with a two character code as listed below.

Abbreviation	Color	Abbreviation	Color
AM	Amber	OG	Orange
BARE	Bare	PK	Pink
BG	Beige	PU	Purple
BK	Black	RD	Red
BN	Brown	RU	Rust
BU	Blue	SR	Silver
CL	Clear	TL	Teal
CR	Cream	TN	Tan
CU	Curry	TQ	Turquoise
GD	Gold	VT	Violet
GN	Green	WH	White
GY	Gray	YE	Yellow
NA	Natural	—	—
Color Modifiers			
L	Light	D	Dark

Additionally, industry standard cable types are not identified by color, but are listed by cable type as follows:

Abbreviation	Cable Type
COAX	Coax Cable
ENET	Ethernet
FW	Flat Wire
HDMI	High Definition Multimedia Interface
LVDS	Low-voltage Differential Signaling
TWINAX	Twinax Cable
USB	Universal Serial Bus

Electronic Delivery Navigation Features

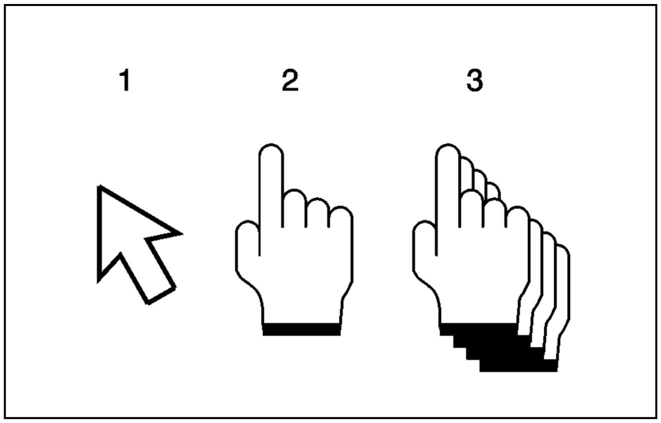
The schematics information has been enhanced for electronic delivery and the following explains the features that are now available.

The enhanced features are categorized into three types:

- Mouse-overs, which are active when the mouse pointer is placed over the activated area

- Hotspots (links to other information), which are active by placing the mouse pointer over the activated area and clicking the left mouse button
- Hotspot Target Highlighting, which is when linking from one graphic to another graphic, the point of interest will be highlighted in red. This feature is available only when linking from a schematic graphic to a component locator/harness routing view, or when linking from a schematic to an electrical center identification view

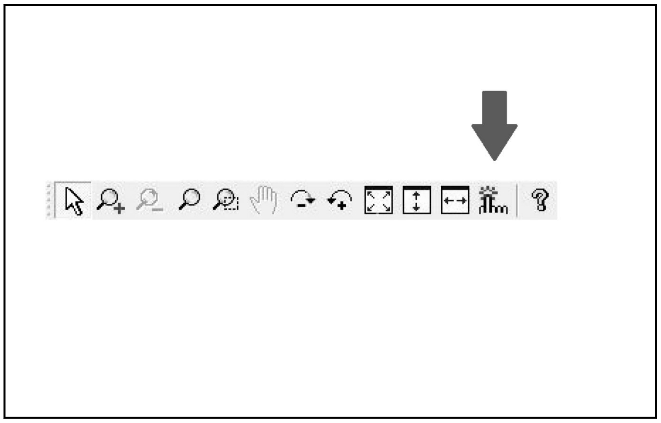
Depending on the amount of information that is linked to from a hotspot, the mouse pointer changes shape.



3819127

1. Basic mouse pointer – this means there are no hotspots available, but there may be a mouse-over available.
2. Single hand pointer – this means there is a mouse-over and hotspot link to a single document. Clicking on these areas will automatically take you to the target link.
3. Multiple hand pointer – this means there is a mouse-over and hotspot link to a multiple document. Clicking on these areas will bring up a pop-up menu that will display all available links. You may then select one of the available links clicking on one of the displayed links.

To see which areas of the schematic information have an available hotspot and/or a mouse-over, select and hold down the highlight hotspots button of the cgm viewer. This will highlight all areas of the graphic that have an available hotspot and/or a mouse-over in red. Once the button is released, the areas of the graphic will no longer be highlighted.



3819130

Each type of schematic related information has some level of these features. The schematic related information consists of the following information types:

- Schematics
- Connector End Views
- Component Locator Views
- Harness Routing Views
- Electrical Center Identification Views
- Master Electrical Component List
- Master Electrical Schematic Icons
- Schematics RPO Code List
- Circuit Number/Wire Colors
- Wire Lines
- Connector Cavities

Schematics

An electrical schematic hotspot is an activated icon or area in the schematic that can be cursor selected to link to additional information. Additionally, each of the hotspots in schematics has a mouse-over.

Hotspots in schematics are categorized into three types:

- Schematic Navigational Icon Hotspots
- Schematic Informational Icon Hotspots
- Schematic Navigational Hotspots

Schematic Navigational Icon Hotspots

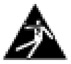
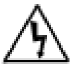
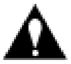
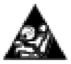
The following lists icons that may appear on the upper right corner of a schematic that have an available mouse-over and hotspot.

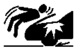
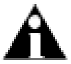
Icon	Mouse-Over	Hotspot Link to Information
LOC 1990537	Master Electrical Component List	Links to the vehicle Master Electrical Component List that shows all electrical components and harness items on the vehicle and has links to any available views
DESC 1990538	Title of the subsystem description and operation	Links to the System Description and Operation
⇄ 1988674	Control Module References	Links to the Control Module References table

Icon	Mouse-Over	Hotspot Link to Information
➡ 1990541	Title of the next schematic page	Links to the next schematic of the subsystem schematics
⬅ 1990542	Title of the previous schematic page	Links to the previous schematic of the subsystem schematics

Schematic Informational Icon Hotspots

The following lists the icons that may appear anywhere on a schematic that have an available mouse-over and hotspot.

Icon	Mouse-Over	Hotspot Link to Information
Danger  1988672	Master Electrical Schematic Icons	Links to the vehicle Master Electrical Schematic Icons list that describes the message for the icon.
High Voltage  1988673	Master Electrical Schematic Icons	Links to the vehicle Master Electrical Schematic Icons list that describes the message for the icon.
Caution  1990543	Master Electrical Schematic Icons	Links to the vehicle Master Electrical Schematic Icons list that describes the message for the icon.
Supplemental Restraint  1988667	Master Electrical Schematic Icons	Links to the vehicle Master Electrical Schematic Icons list that describes the message for the icon.

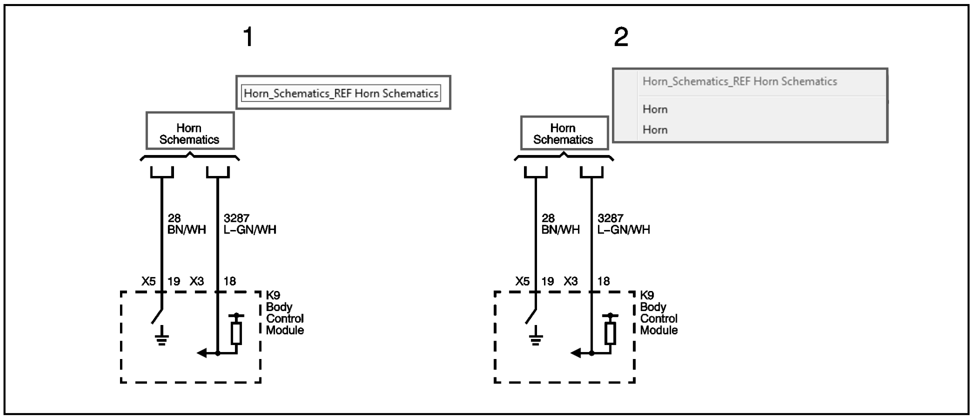
Icon	Mouse-Over	Hotspot Link to Information
Pedestrian Impact  3814889	Master Electrical Schematic Icons	Links to the vehicle Master Electrical Schematic Icons list that describes the message for the icon.
Additional Information  1988670	Master Electrical Schematic Icons	Links to the vehicle Master Electrical Schematic Icons list that describes the message for the icon.

Schematic Navigational Hotspots

In addition to the navigational icons, schematics have other active hotspots that link to supporting information such as related schematics, component locator views, harness routing views, and connector end views.

These hotspots can be either text based or symbol based. The following are the items that will have a mouse-over and hotspot.

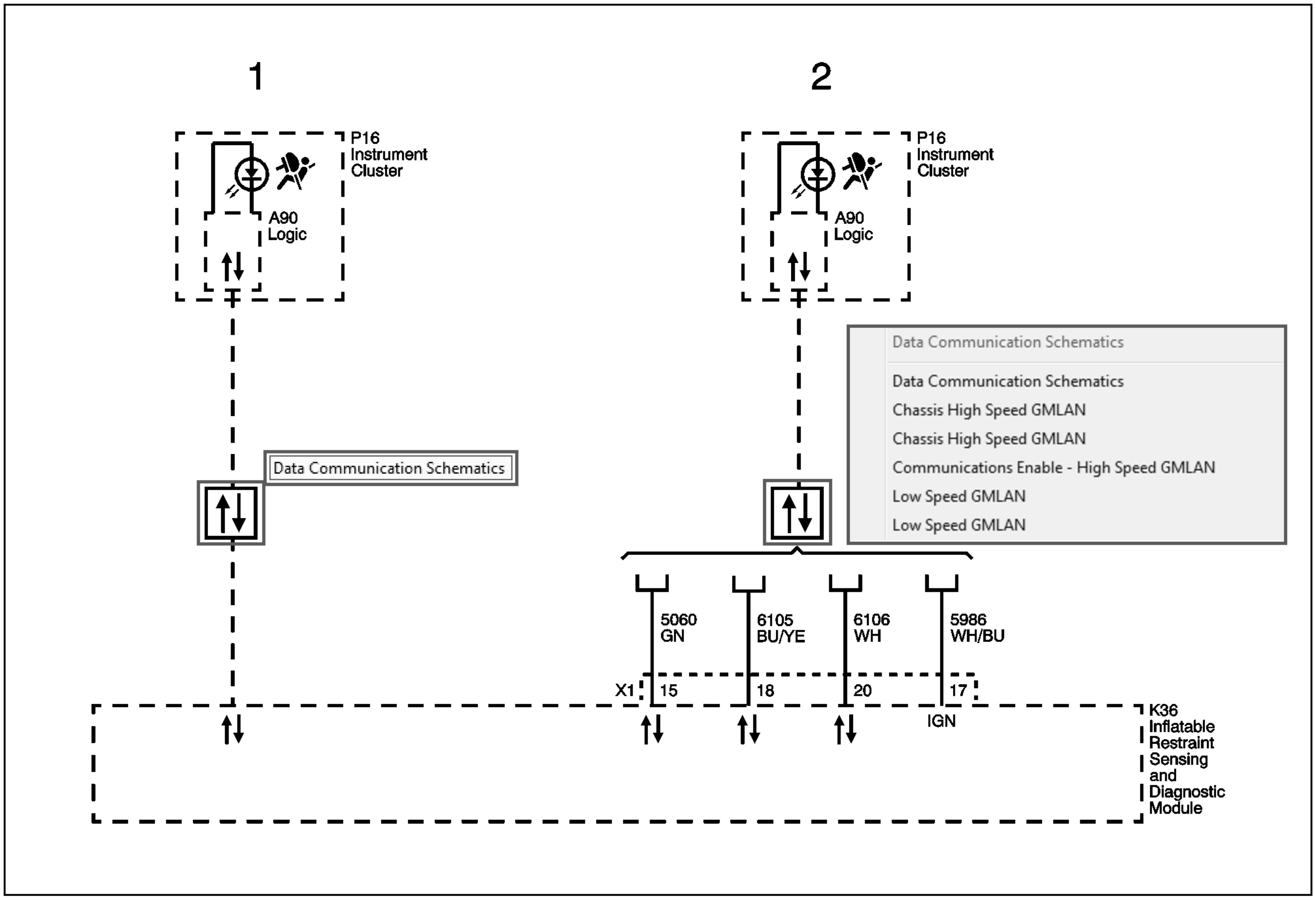
Schematic Title Circuit References


1
2
Horn_Schematics_REF Horn Schematics
Horn Schematics
Horn_Schematics_REF Horn Schematics
Horn
Horn
Horn Schematics
28 BN/WH
3287 L–GN/WH
X5 19 X3 18
K9 Body Control Module
28 BN/WH
3287 L–GN/WH
X5 19 X3 18
K9 Body Control Module

3814891

1. **Mouse-over:** Displays the title of the schematic page linked to.
2. **Hotspot Link to Information:** Links to the individual subsystem schematic page(s) that shows the circuit in detail. If multiple circuits are included, or if the circuit is shown in multiple schematics, a menu will appear when the link is selected. This menu includes links to all schematics that contain the same circuit number as the circuit being referenced. Additionally, when the target schematic is opened, the referenced circuit will be highlighted to draw visual attention. Note that when there are multiple target links, the links may appear to be duplicate in the menu, however, they are not. The exact same title is repeated for each circuit number that is pointing to the same target schematic. A future update will include the circuit number before the link description to further assist in link selection.

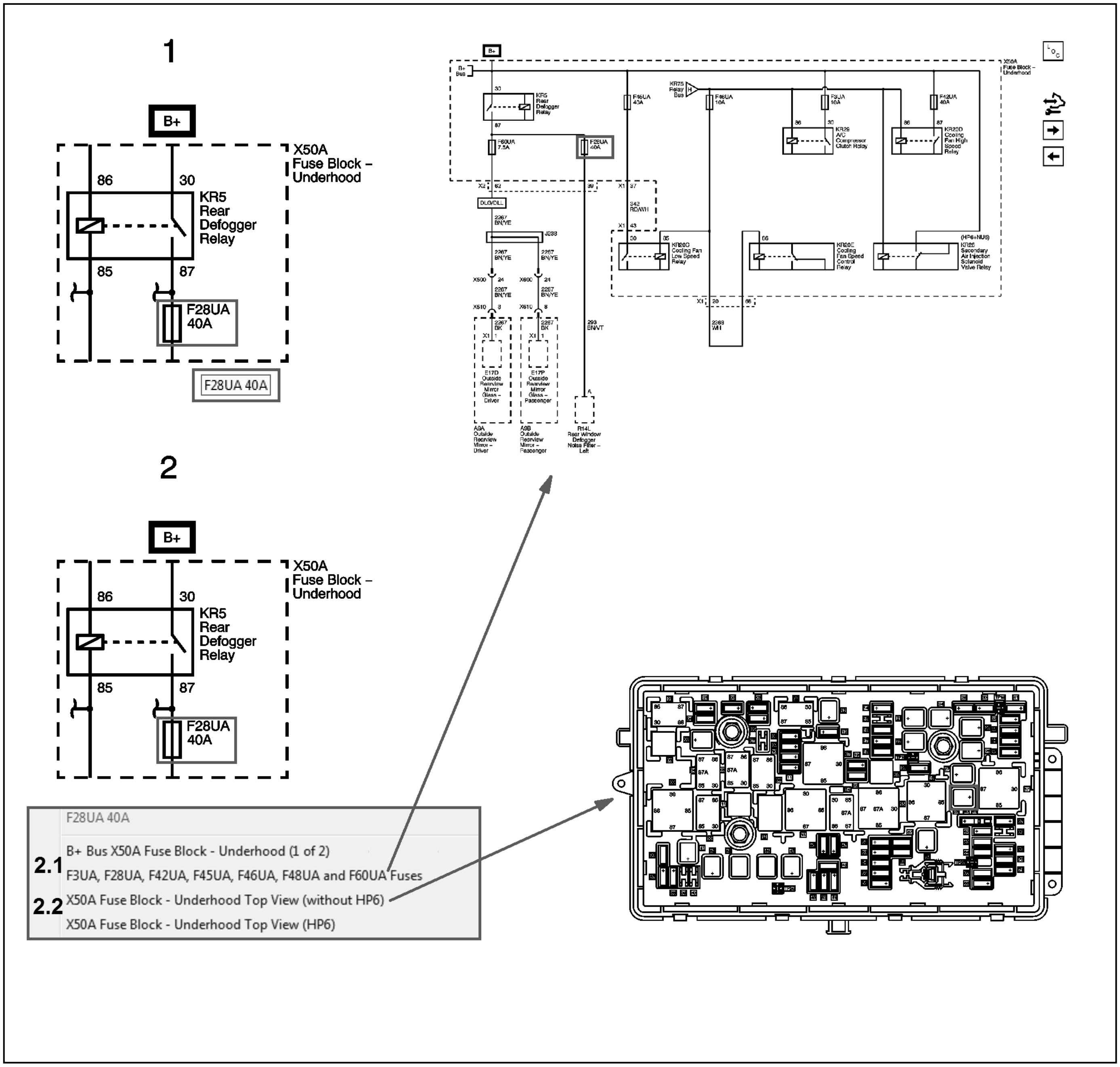
Serial Data Functional Circuit Icon


1
2
P16 Instrument Cluster
A90 Logic
P16 Instrument Cluster
A90 Logic
Data Communication Schematics
Data Communication Schematics
Data Communication Schematics
Chassis High Speed GMLAN
Chassis High Speed GMLAN
Communications Enable - High Speed GMLAN
Low Speed GMLAN
Low Speed GMLAN
5060 GN
6105 BU/YE
6106 WH
5986 WH/BU
X1
15
18
20
17
IGN
K36 Inflatable Restraint Sensing and Diagnostic Module

3818612

1. **Mouse-over:** Displays the schematic title Data Communication Schematics.
2. **Hotspot Link to Information:**
   - ⇒ When a dashed serial data wire and icon are shown without any circuit numbers, the serial data circuit icon will link to the complete list of Data Communication schematic pages, and not a specific schematic. This is due to no circuit numbers are shown.
   - ⇒ When a circuit wire(s) are shown with circuit numbers, a menu will appear when the link is selected. This menu includes links to the list of Data Communication schematic pages as well as links to the individual schematics that contain the same circuit number as the circuit being referenced. Additionally, when the target schematic is opened, the referenced circuit will be highlighted to draw visual attention. Note that when there are multiple target links, the links may appear to be duplicate in the menu, however, they are not. The exact same title is repeated for each circuit number that is pointing to the same target schematic. A future update will include the circuit number before the link description to further assist in link selection.

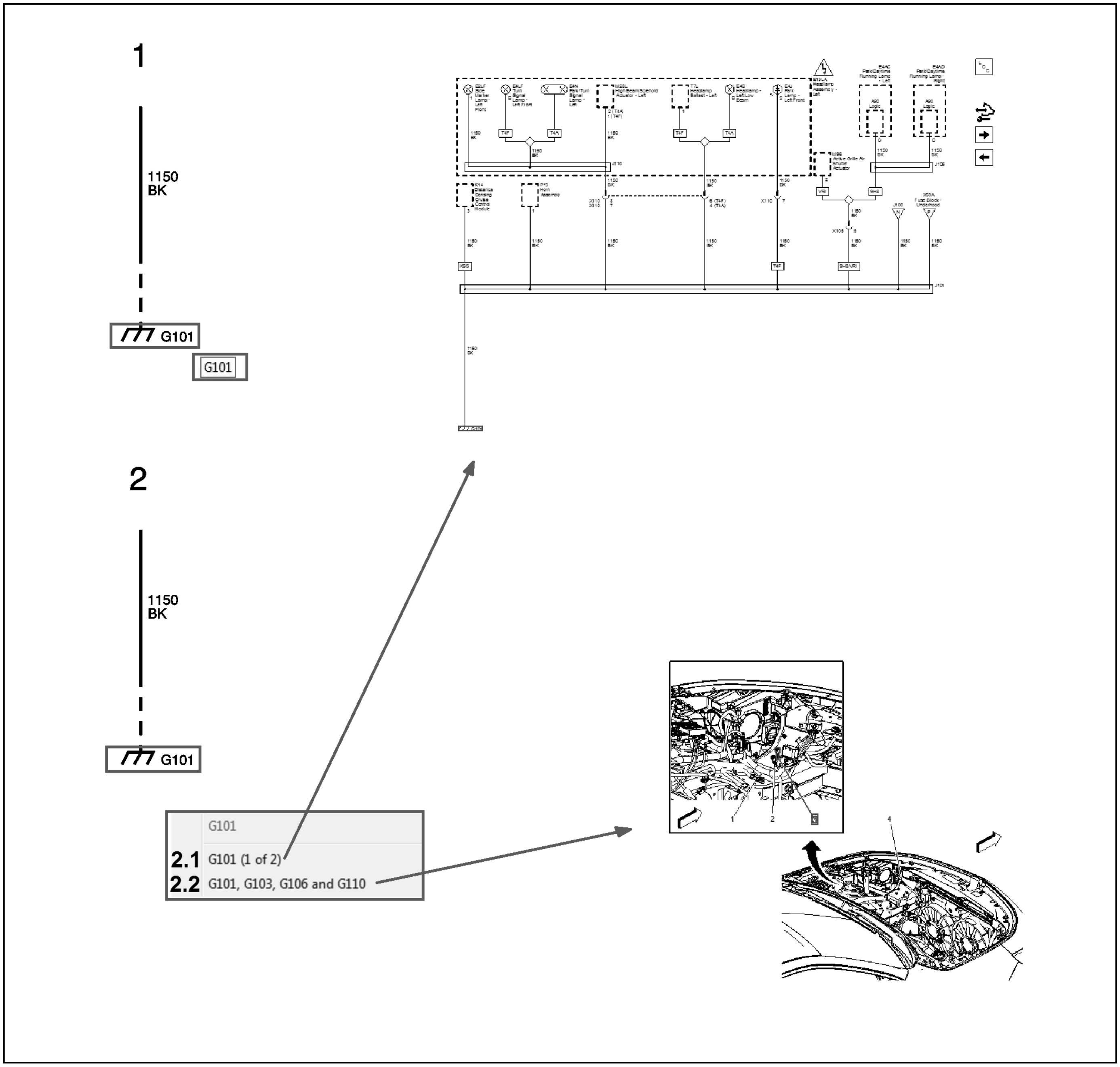
Fuse/Circuit Breaker Symbol and Name within Subsystem Schematics


1
B+
86
30
X50A Fuse Block – Underhood
KR5 Rear Defogger Relay
85
87
F28UA 40A
F28UA 40A
2
B+
86
30
X50A Fuse Block – Underhood
KR5 Rear Defogger Relay
85
87
F28UA 40A
F28UA 40A
2.1
B+ Bus X50A Fuse Block - Underhood (1 of 2)
F3UA, F28UA, F42UA, F45UA, F46UA, F48UA and F60UA Fuses
2.2
X50A Fuse Block - Underhood Top View (without HP6)
X50A Fuse Block - Underhood Top View (HP6)

3818725

1. **Mouse-over:** Displays the code and the amperage of the protection device.
2. **Hotspot Link to Information:**
   - ⇒ When multiple links are available, a menu will appear when the link is selected. This menu includes all available links in a structured sequence.
   - 2.1. Links to the individual schematic page(s) within the Power Distribution Schematics where the circuits are shown in detail. Additionally, when the target schematic is opened, the circuit protection device will be highlighted to draw visual attention.
   - 2.2. Links to individual fuse block top or bottom view(s) within the Electrical Center Identification Views and will show where the device is located in the fuse block. Additionally, when the target view is opened, the device outline will be highlighted for visual attention.

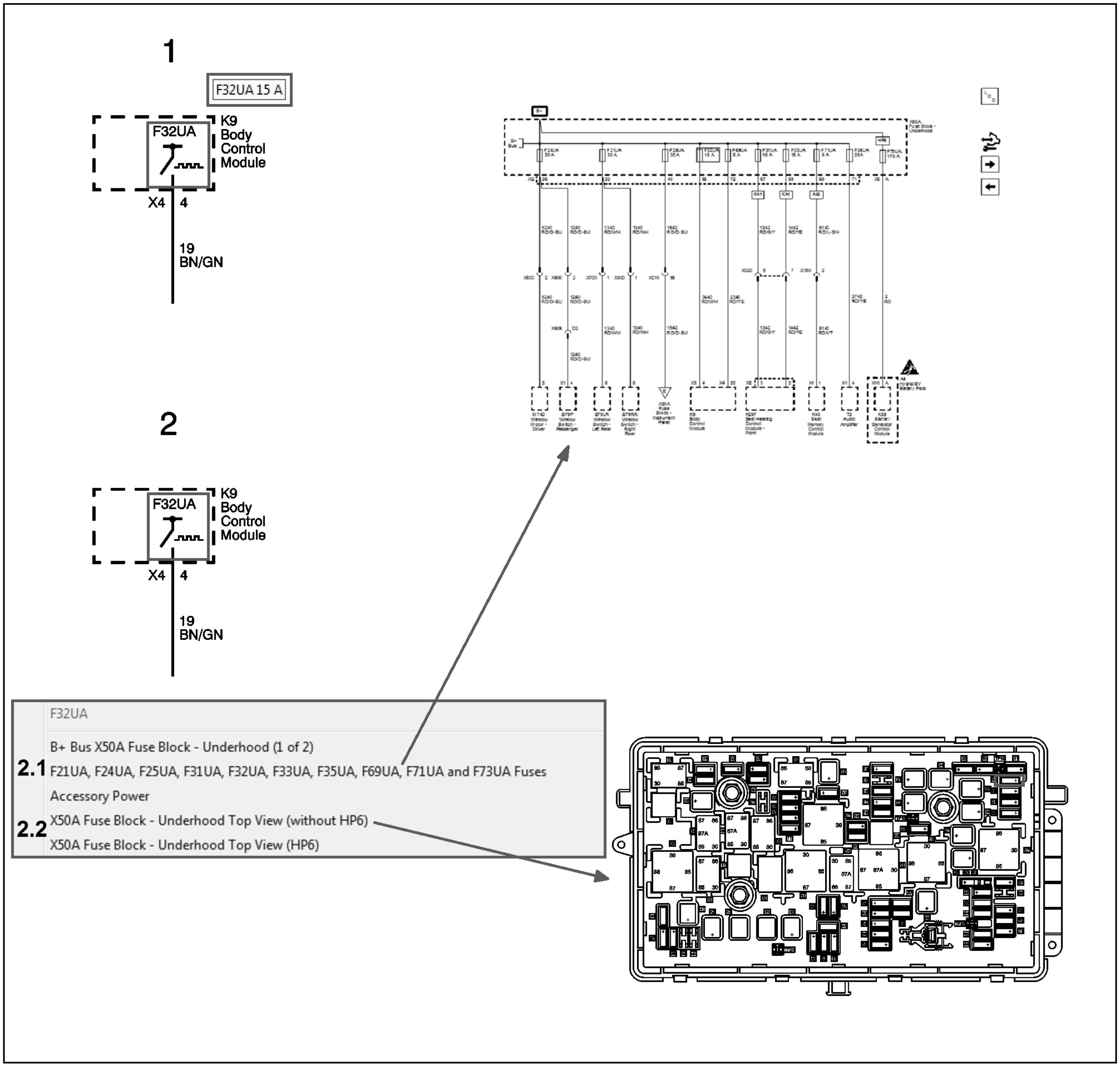
Ground Symbol/Name in Subsystem Schematics



3818918

1. **Mouse-over:** Displays the ground number.
2. **Hotspot Link to Information:**
   - ⇒ When multiple links are available, a menu will appear when the link is selected. This menu includes all available links in a structured sequence.
   - 2.1. Links to the individual schematic page(s) within the Ground Distribution Schematics where the circuits are shown in detail. Additionally, when the target schematic is opened, the ground will be highlighted to draw visual attention.
   - 2.2. Links to the individual locator view(s) within the Ground Views and will show where the ground is located on the vehicle. Additionally, when the target view is opened, the ground and callout leader line/number will be highlighted to draw visual attention.

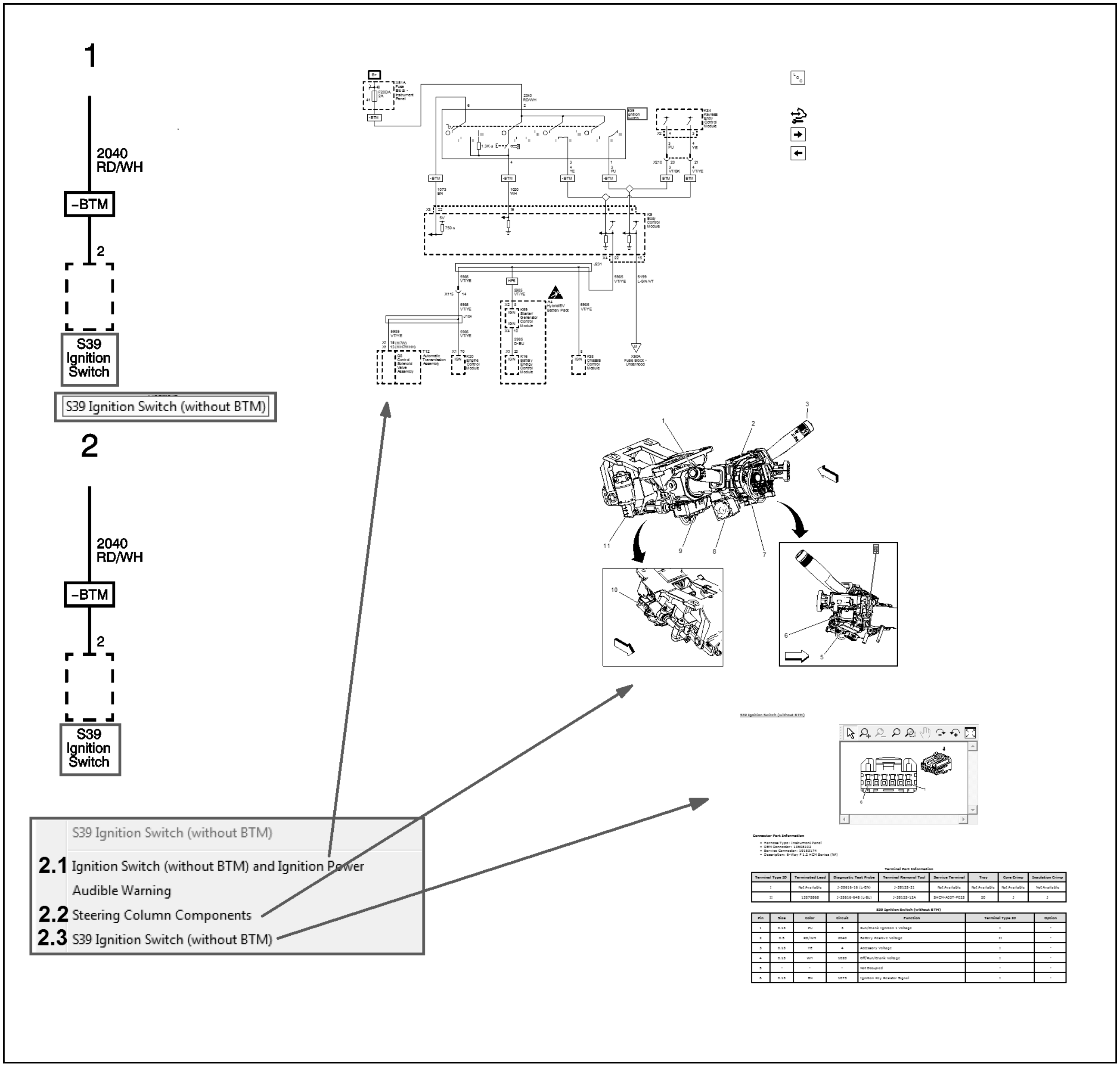
Body Control Module High-Side Driver Output Symbol/Driver Source Fuse Name in Subsystem Schematics


1
F32UA 15 A
F32UA
K9
Body
Control
Module
X4 4
19
BN/GN
2
F32UA
K9
Body
Control
Module
X4 4
19
BN/GN
F32UA
B+ Bus X50A Fuse Block - Underhood (1 of 2)
2.1
F21UA, F24UA, F25UA, F31UA, F32UA, F33UA, F35UA, F69UA, F71UA and F73UA Fuses
Accessory Power
2.2
X50A Fuse Block - Underhood Top View (without HP6)
X50A Fuse Block - Underhood Top View (HP6)

3819026

1. **Mouse-over:** Displays the code of the protection device that supplies the high-side driver output circuit.
2. **Hotspot Link to Information:**
   ⇒ When multiple links are available, a menu will appear when the link is selected. This menu includes all available links in a structured sequence.
   - 2.1. Links to the individual schematic page(s) within the Power Distribution Schematics where the circuits are shown in detail. Additionally, when the target schematic is opened, the circuit protection device will be highlighted to draw visual attention.
   - 2.2. Links to individual fuse block top or bottom view(s) within the Electrical Center Identification Views and will show where the device is located in the fuse block. Additionally, when the target view is opened, the device outline will be highlighted for visual attention.

Component Name in Power and Ground Distribution Schematics


1
2040
RD/WH
–BTM
2
S39
Ignition
Switch
S39 Ignition Switch (without BTM)
2
2040
RD/WH
–BTM
2
S39
Ignition
Switch
S39 Ignition Switch (without BTM)
2.1 Ignition Switch (without BTM) and Ignition Power Audible Warning
2.2 Steering Column Components
2.3 S39 Ignition Switch (without BTM)

3819063

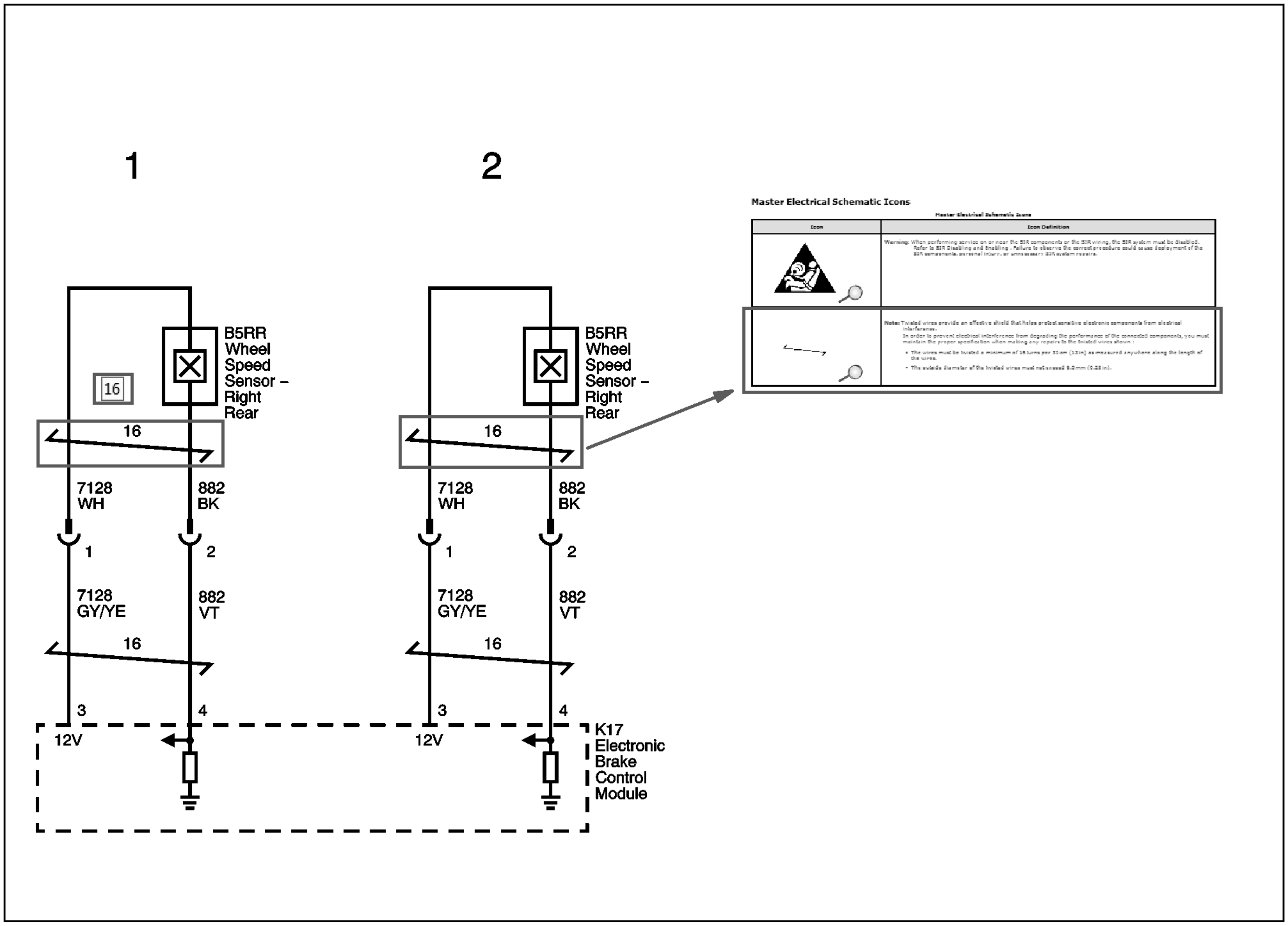
1. **Mouse-over:** Displays the code and name of the component.
2. **Hotspot Link to Information:**
   - ⇒ When multiple links are available, a menu will appear when the link is selected. This menu includes all available links in a structured sequence.

2.1. Links to the individual schematic page(s) within the Subsystem Schematic(s) where the circuits are shown in detail. Additionally, when the target schematic is opened, the component code and name will be highlighted to draw visual attention.

2.2. Links to the individual locator view(s) within the applicable component view category and will show where the component is located on the vehicle. Additionally, when the target view is opened, the component and callout leader line/number will be highlighted to draw visual attention.

2.3. Links to individual connector end view(s) within the Component Connector End Views.

Twisted Pair Symbols



Master Electrical Schematic Icons

Master Electrical Schematic Icons

Warning: When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling . Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.

Note: Twisted wires provide an effective shield that helps protect sensitive electronic components from electrical interference.

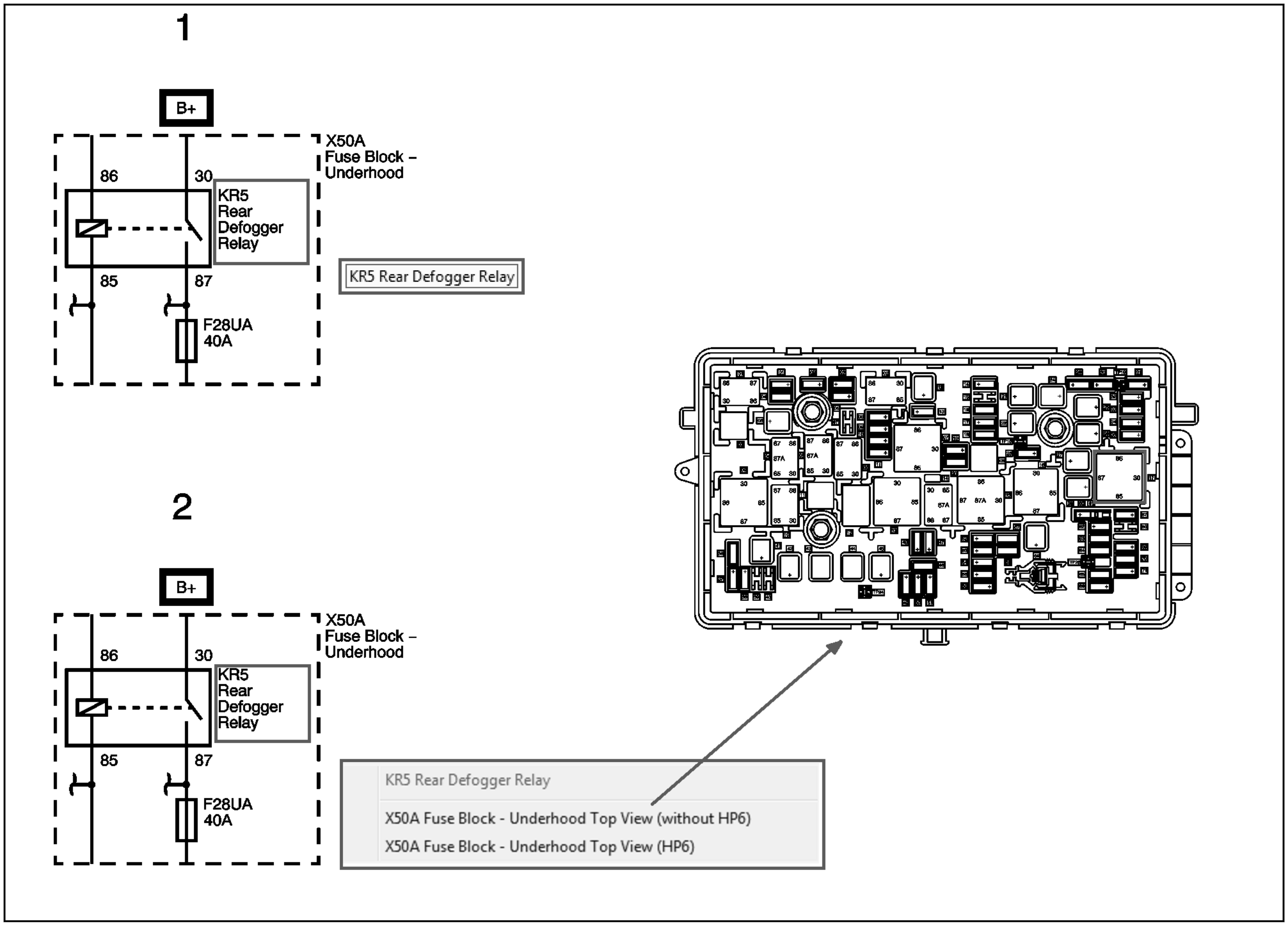
In order to prevent electrical interference from degrading the performance of the connected components, you must maintain the proper specification when making any repairs to the twisted wires shown :

- The wires must be twisted a minimum of 16 turns per 31cm (12in) as measured anywhere along the length of the wires.
- The outside diameter of the twisted wires must not exceed 6.0mm (0.25 in).

3819064

1. **Mouse-over:** Displays the repair specification for the number of twists of the wire within the specified distance.
2. **Hotspot Link to Information:** Links to the Master Electrical Schematic Icons list that shows the icon along with the repair specification details for the wire.

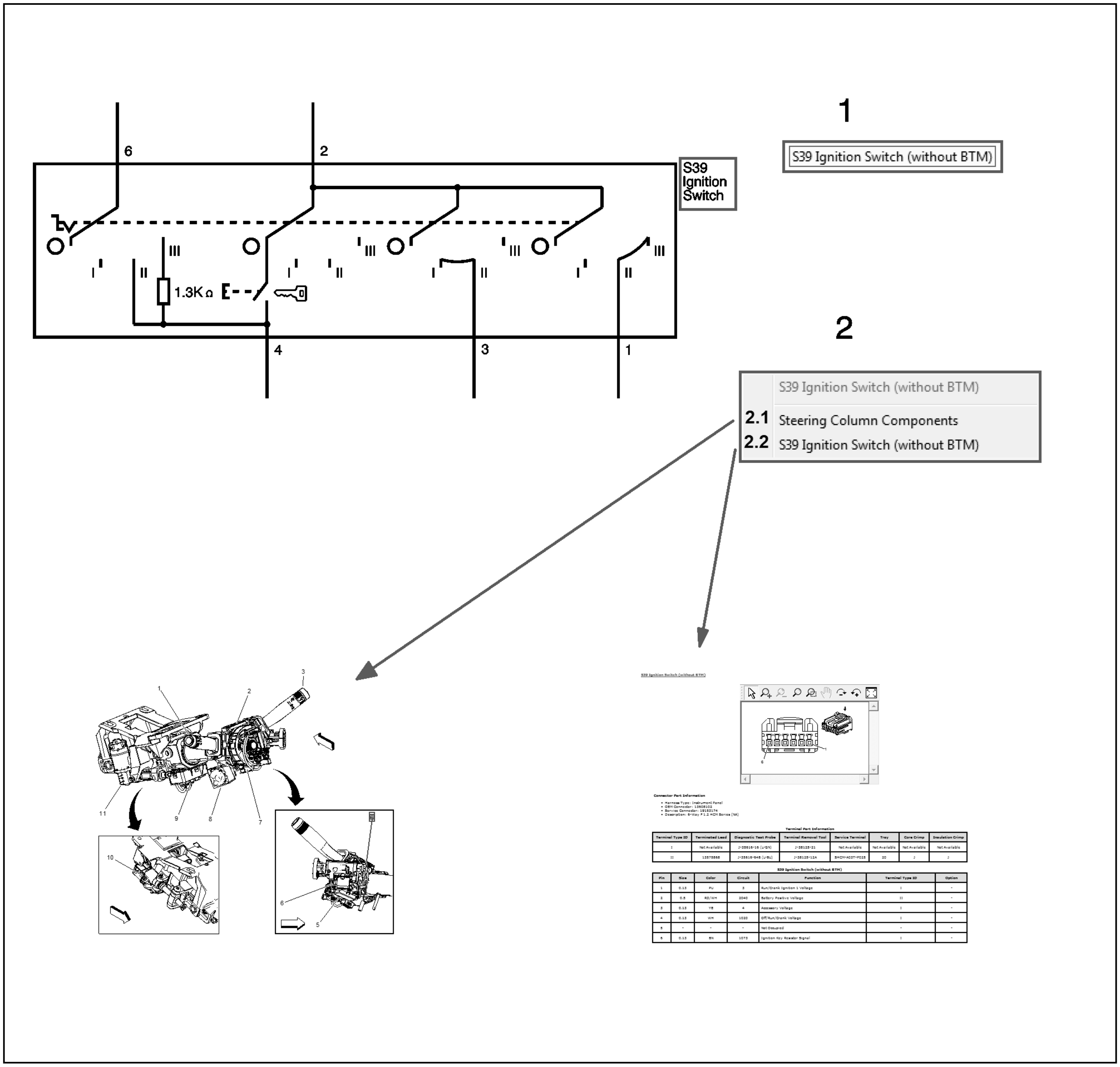
Relay Name (located within a block)


1
B+
X50A
Fuse Block –
Underhood
86
30
KR5
Rear
Defogger
Relay
85
87
F28UA
40A
KR5 Rear Defogger Relay
2
B+
X50A
Fuse Block –
Underhood
86
30
KR5
Rear
Defogger
Relay
85
87
F28UA
40A
KR5 Rear Defogger Relay
X50A Fuse Block - Underhood Top View (without HP6)
X50A Fuse Block - Underhood Top View (HP6)

3819124

1. **Mouse-over:** Displays the relay code and name.
2. **Hotspot Link to Information:** Links to individual fuse block top or bottom view(s) within the Electrical Center Identification Views and will show where the device is located in the fuse block. Additionally, when the target view is opened, the device outline will be highlighted for visual attention.

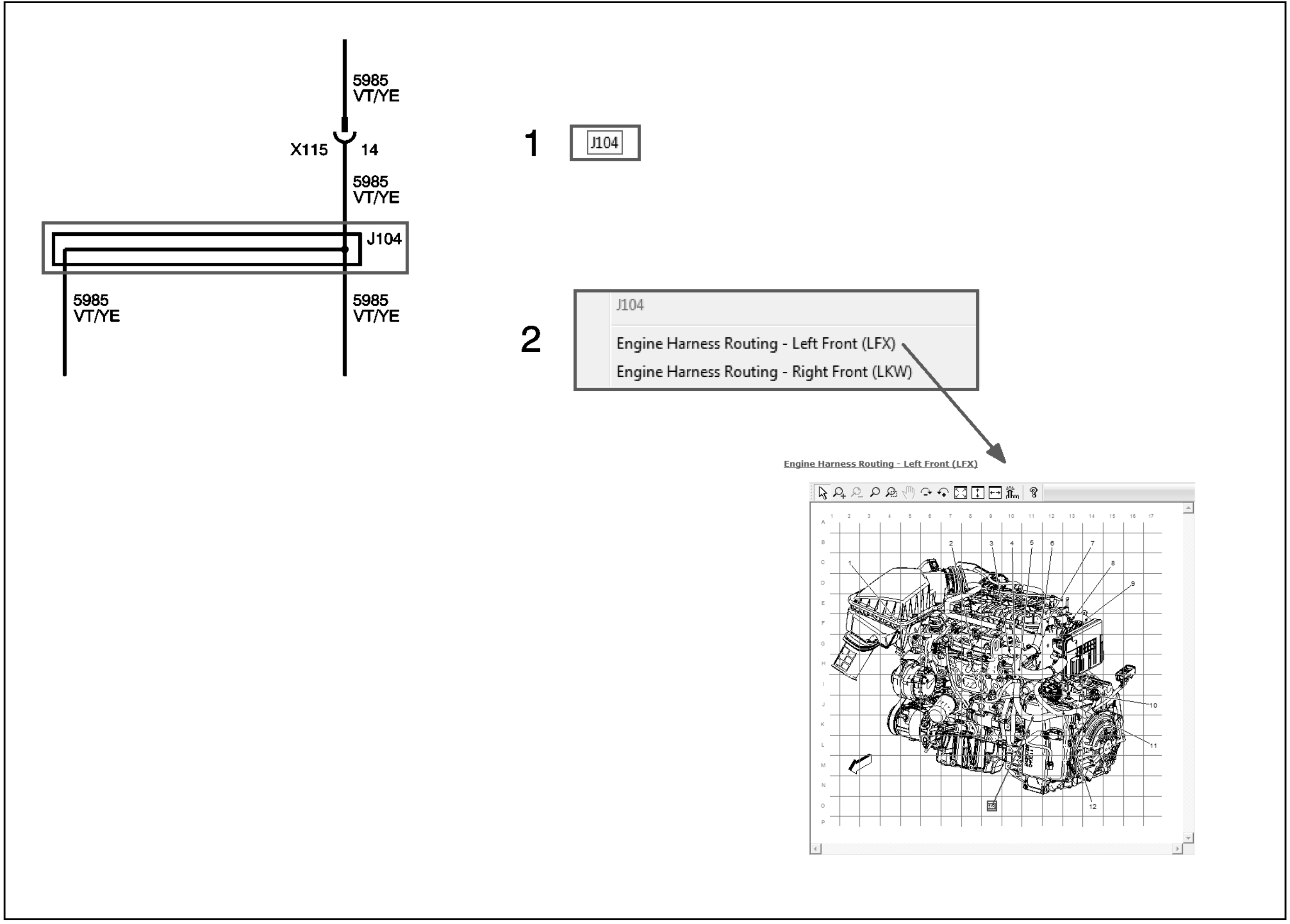
Component Name in Subsystem Schematics


6
2
S39 Ignition Switch
1.3KΩ
4
3
1
1
S39 Ignition Switch (without BTM)
2
S39 Ignition Switch (without BTM)
2.1 Steering Column Components
2.2 S39 Ignition Switch (without BTM)

3819141

1. **Mouse-over:** Displays the code and name of the component.
2. **Hotspot Link to Information:**
   - ⇒ When multiple links are available, a menu will appear when the link is selected. This menu includes all available links in a structured sequence.
   - 2.1. Links to the individual locator view(s) within the applicable component view category and will show where the component is located on the vehicle. Additionally, when the target view is opened, the component and callout leader line/number will be highlighted to draw visual attention.
   - 2.2. Links to individual connector end view(s) within the Component Connector End Views.

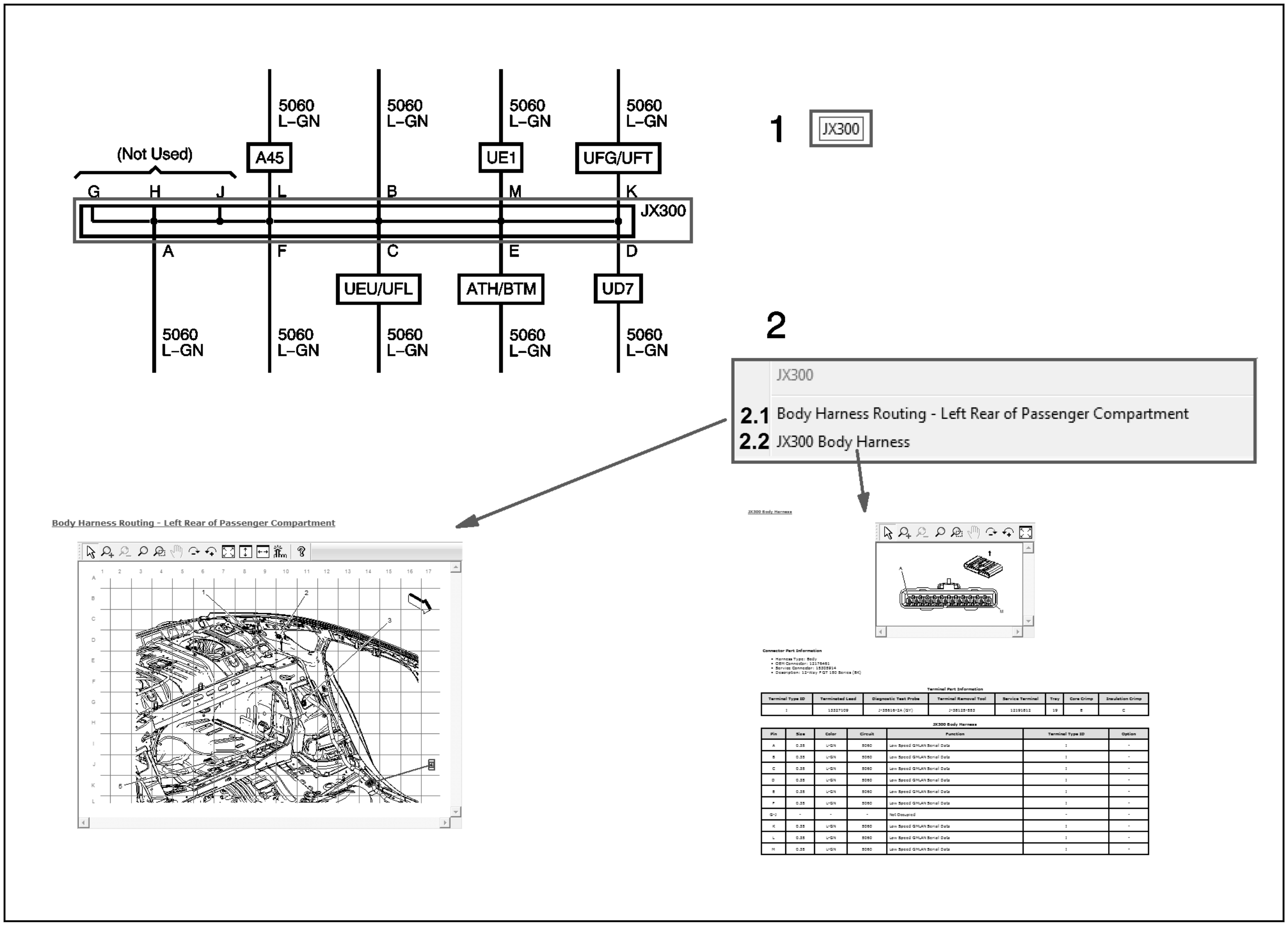
Splice Names


5985
VT/YE
X115
14
5985
VT/YE
J104
5985
VT/YE
5985
VT/YE
1
J104
2
J104
Engine Harness Routing - Left Front (LFX)
Engine Harness Routing - Right Front (LKW)
Engine Harness Routing - Left Front (LFX)

3819287

1. **Mouse-over:** Displays the code of the harness splice.
2. **Hotspot Link to Information:** Links to the individual harness routing view(s) within the Harness Routing Views and will show where the harness item is located on the vehicle harness. Additionally, when the target view is opened, the harness item and callout leader line/number will be highlighted to draw visual attention.

Splice Pack Names


5060
L–GN
(Not Used)
A45
UE1
UFG/UFT
G
H
J
L
B
M
K
JX300
A
F
C
E
D
UEU/UFL
ATH/BTM
UD7
1
JX300
2
JX300
2.1 Body Harness Routing - Left Rear of Passenger Compartment
2.2 JX300 Body Harness
Body Harness Routing - Left Rear of Passenger Compartment
JX300 Body Harness

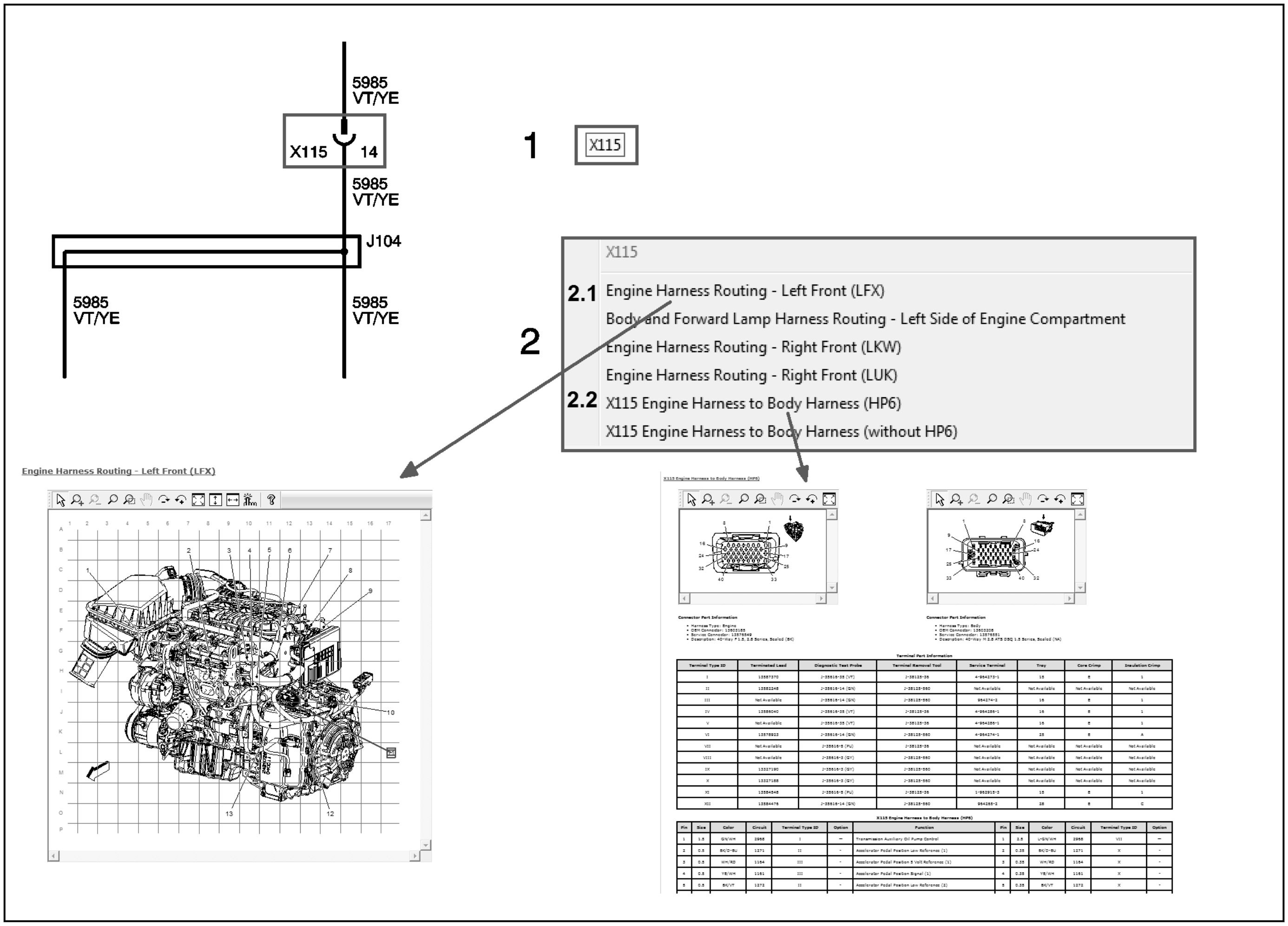
3819454

1. **Mouse-over:** Displays the code of the harness splice pack.
2. **Hotspot Link to Information:**
   - ⇒ When multiple links are available, a menu will appear when the link is selected. This menu includes all available links in a structured sequence.

2.1. Links to the individual harness routing view(s) within the Harness Routing Views and will show where the harness item is located on the vehicle harness. Additionally, when the target view is opened, the harness item and callout leader line/number will be highlighted to draw visual attention.

2.2. Links to individual connector end view(s) within the Splice Pack Connector End Views.

Inline Harness Connector Names


5985
VT/YE
X115
14
5985
VT/YE
J104
5985
VT/YE
5985
VT/YE
1
X115
2
X115
2.1
Engine Harness Routing - Left Front (LFX)
Body and Forward Lamp Harness Routing - Left Side of Engine Compartment
Engine Harness Routing - Right Front (LKW)
Engine Harness Routing - Right Front (LUK)
2.2
X115 Engine Harness to Body Harness (HP6)
X115 Engine Harness to Body Harness (without HP6)
Engine Harness Routing - Left Front (LFX)

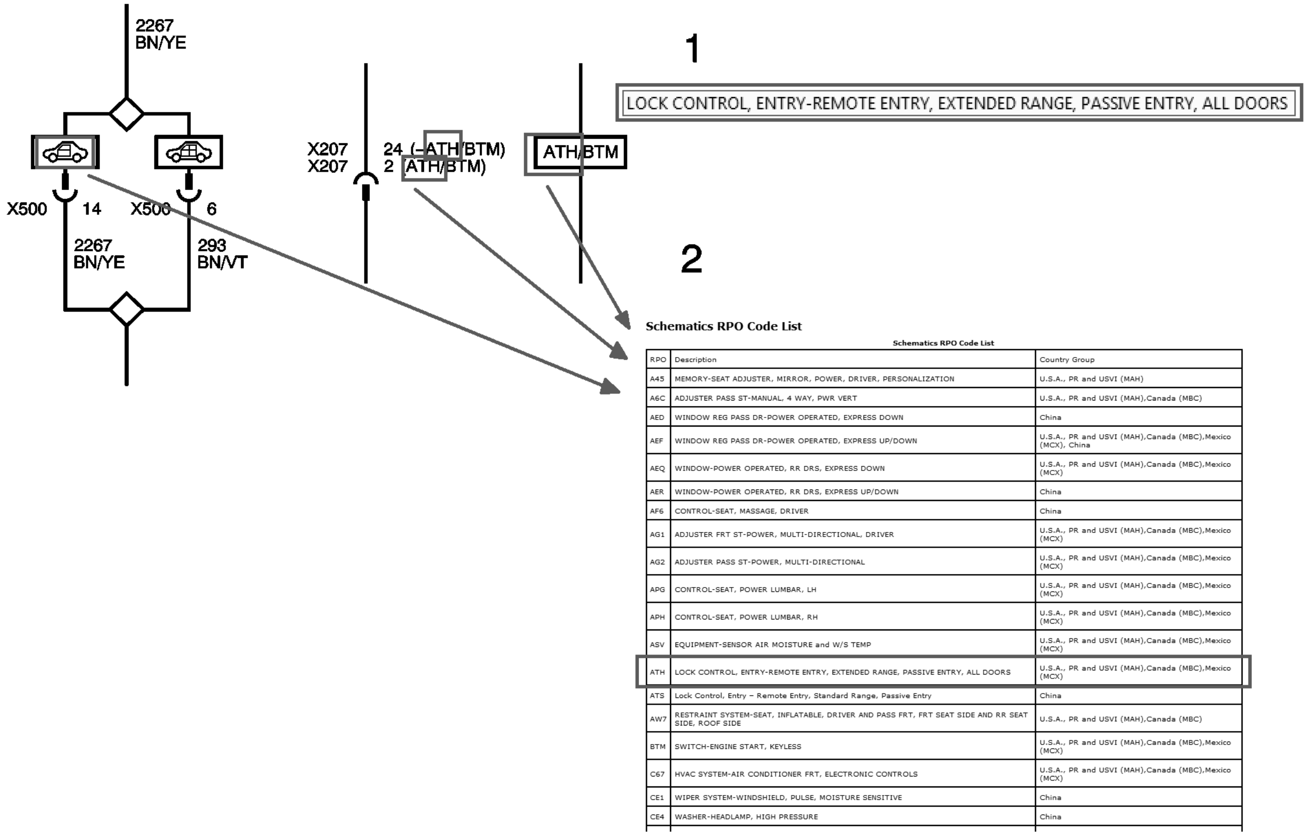
3819345

1. **Mouse-over:** Displays the code of the inline harness connector.
2. **Hotspot Link to Information:**
   - ⇒ When multiple links are available, a menu will appear when the link is selected. This menu includes all available links in a structured sequence.

2.1. Links to the individual harness routing view(s) within the Harness Routing Views and will show where the harness item is located on the vehicle harness. Additionally, when the target view is opened, the harness item and callout leader line/number will be highlighted to draw visual attention.

2.2. Links to individual connector end view(s) within the Inline Harness Connector End Views.

Regular Production Option (RPO) Codes/Icons


2267
BN/YE
X500
14
X500
6
2267
BN/YE
293
BN/VT
X207
X207
24 (–ATH/BTM)
2 ATH/BTM)
ATH/BTM
1
LOCK CONTROL, ENTRY-REMOTE ENTRY, EXTENDED RANGE, PASSIVE ENTRY, ALL DOORS
2

Schematics RPO Code List

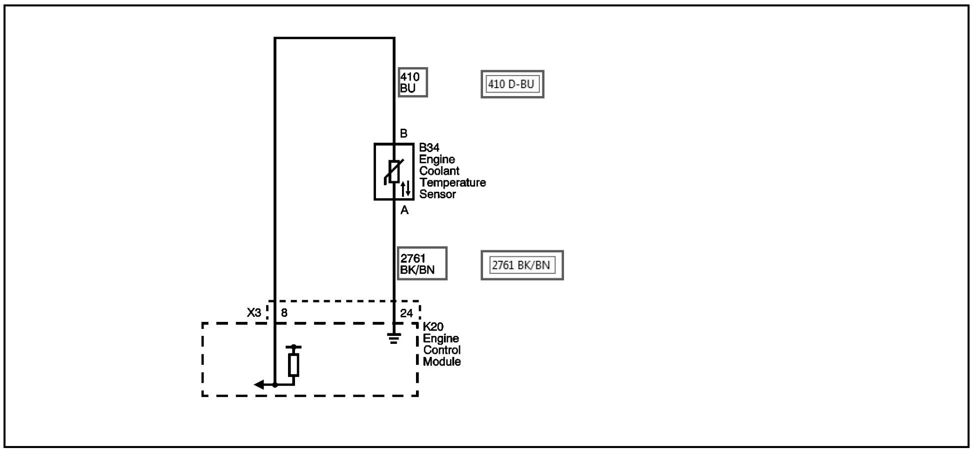
Schematics RPO Code List

RPO	Description	Country Group
A45	MEMORY-SEAT ADJUSTER, MIRROR, POWER, DRIVER, PERSONALIZATION	U.S.A., PR and USVI (MAH)
A6C	ADJUSTER PASS ST-MANUAL, 4 WAY, PWR VERT	U.S.A., PR and USVI (MAH),Canada (MBC)
AED	WINDOW REG PASS DR-POWER OPERATED, EXPRESS DOWN	China
AEF	WINDOW REG PASS DR-POWER OPERATED, EXPRESS UP/DOWN	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX), China
AEQ	WINDOW-POWER OPERATED, RR DRS, EXPRESS DOWN	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
AER	WINDOW-POWER OPERATED, RR DRS, EXPRESS UP/DOWN	China
AF6	CONTROL-SEAT, MASSAGE, DRIVER	China
AG1	ADJUSTER FRT ST-POWER, MULTI-DIRECTIONAL, DRIVER	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
AG2	ADJUSTER PASS ST-POWER, MULTI-DIRECTIONAL	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
APG	CONTROL-SEAT, POWER LUMBAR, LH	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
APH	CONTROL-SEAT, POWER LUMBAR, RH	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
ASV	EQUIPMENT-SENSOR AIR MOISTURE and W/S TEMP	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
ATH	LOCK CONTROL, ENTRY-REMOTE ENTRY, EXTENDED RANGE, PASSIVE ENTRY, ALL DOORS	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
ATS	Lock Control, Entry – Remote Entry, Standard Range, Passive Entry	China
AW7	RESTRAINT SYSTEM-SEAT, INFLATABLE, DRIVER AND PASS FRT, FRT SEAT SIDE AND RR SEAT SIDE, ROOF SIDE	U.S.A., PR and USVI (MAH),Canada (MBC)
BTM	SWITCH-ENGINE START, KEYLESS	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
C67	HVAC SYSTEM-AIR CONDITIONER FRT, ELECTRONIC CONTROLS	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
CE1	WIPER SYSTEM-WINDSHIELD, PULSE, MOISTURE SENSITIVE	China
CE4	WASHER-HEADLAMP, HIGH PRESSURE	China

3819777

1. **Mouse-over:** Displays the description of the RPO code as well as the country group names where the option is possible to order. Note that each RPO shown will have its own mouse-over and description. Also note that the mouse-over does not include any symbols indicating with (shown as a + sign if combined option) or without (shown as a – sign to mean without/except).
2. **Hotspot Link to Information:** Links to the Schematics RPO Code List that shows the RPO, the description of the option, and the country group names where the option is possible to order.

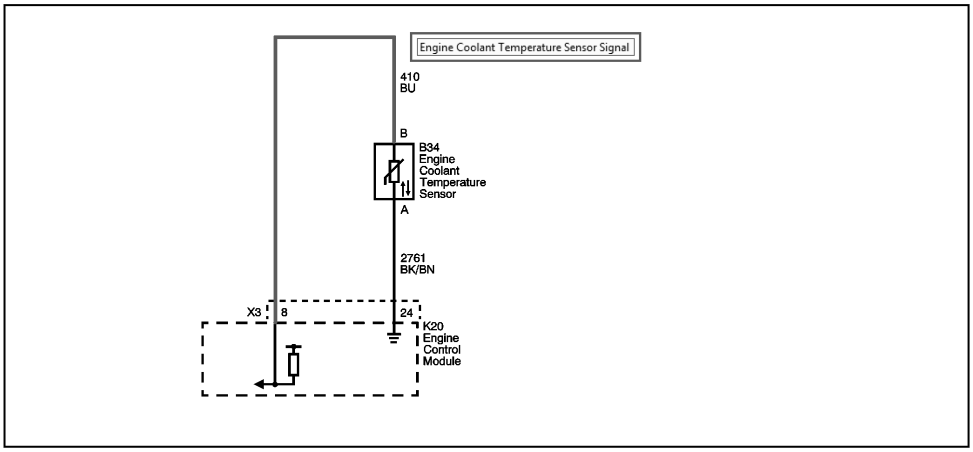
Circuit Number/Wire Colors


410
BU
410 D-BU
B
B34
Engine
Coolant
Temperature
Sensor
A
2761
BK/BN
2761 BK/BN
X3
8
24
K20
Engine
Control
Module

3819880

1. **Mouse-over:** Displays the circuit number (if shown) and the color abbreviation of the wire insulation. Refer to Color Abbreviations for an explanation of each wire color abbreviation. A future update may spell out the wire colors in all languages.
2. **Hotspot Link to Information:** None at this time.

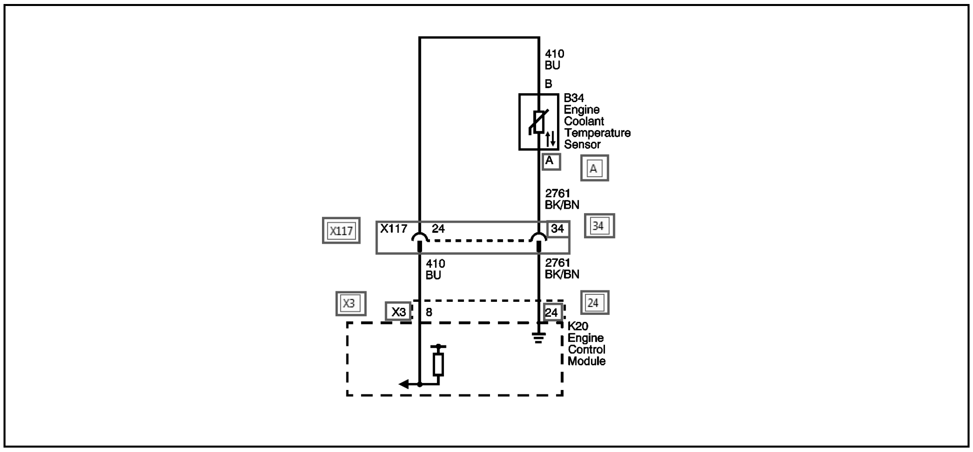
Wire Lines


Engine Coolant Temperature Sensor Signal
410
BU
B
B34
Engine
Coolant
Temperature
Sensor
A
2761
BK/BN
X3
8
24
K20
Engine
Control
Module

3819888

1. **Mouse-over:** Displays the circuit function of the wire as used on the vehicle. This same function is shown in the connector end view pinout table for the component the wire connects. Note if there is no circuit number shown, the circuit will not have an associated mouse-over.
2. **Hotspot Link to Information:** None at this time. A future update may include links to harness routing views to show the routing of the circuit within the vehicle harness.

Connector Identifiers and Cavities

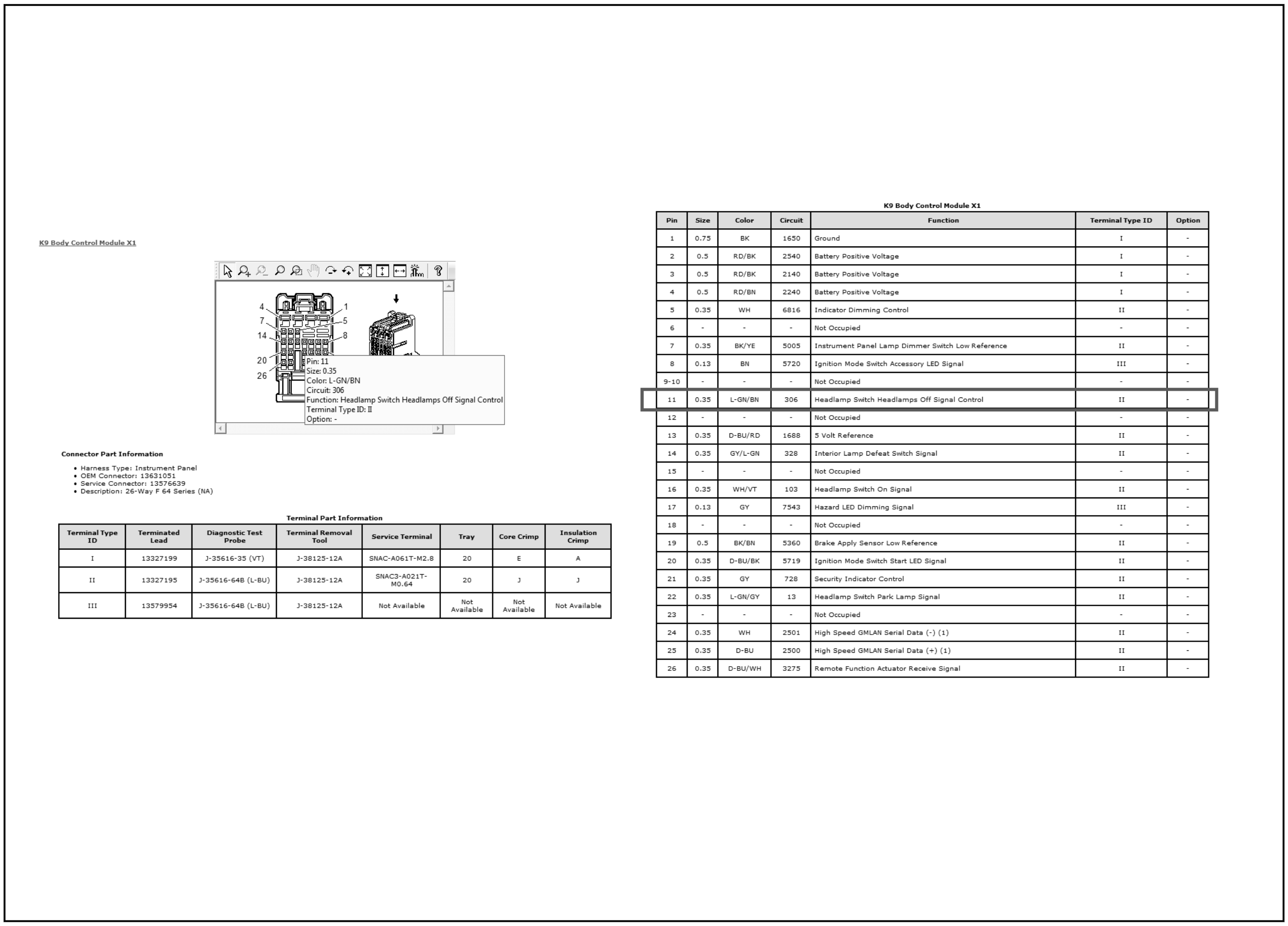

410
BU
B
B34
Engine
Coolant
Temperature
Sensor
A
A
2761
BK/BN
X117
X117
24
34
34
410
BU
2761
BK/BN
X3
X3
8
24
24
K20
Engine
Control
Module

3819889

1. **Mouse-over:** Displays the cavity (pin) identifier (letter/number) for the connection at the component or inline harness connection.
2. **Hotspot Link to Information:** None at this time.

Connector End Views

Connector end view graphics now have mouse-overs to show the wire details of each of the populated cavities. Additionally, the terminal part information has been restructured into an easier to read table.



K9 Body Control Module X1

Pin: 11
Size: 0.35
Color: L-GN/BN
Circuit: 306
Function: Headlamp Switch Headlamps Off Signal Control
Terminal Type ID: II
Option: -

Connector Part Information

- Harness Type: Instrument Panel
- OEM Connector: 13631051
- Service Connector: 13576639
- Description: 26-Way F 64 Series (NA)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool	Service Terminal	Tray	Core Crimp	Insulation Crimp
I	13327199	J-35616-35 (VT)	J-38125-12A	SNAC-A061T-M2.8	20	E	A
II	13327195	J-35616-64B (L-BU)	J-38125-12A	SNAC3-A021T-M0.64	20	J	J
III	13579954	J-35616-64B (L-BU)	J-38125-12A	Not Available	Not Available	Not Available	Not Available

K9 Body Control Module X1

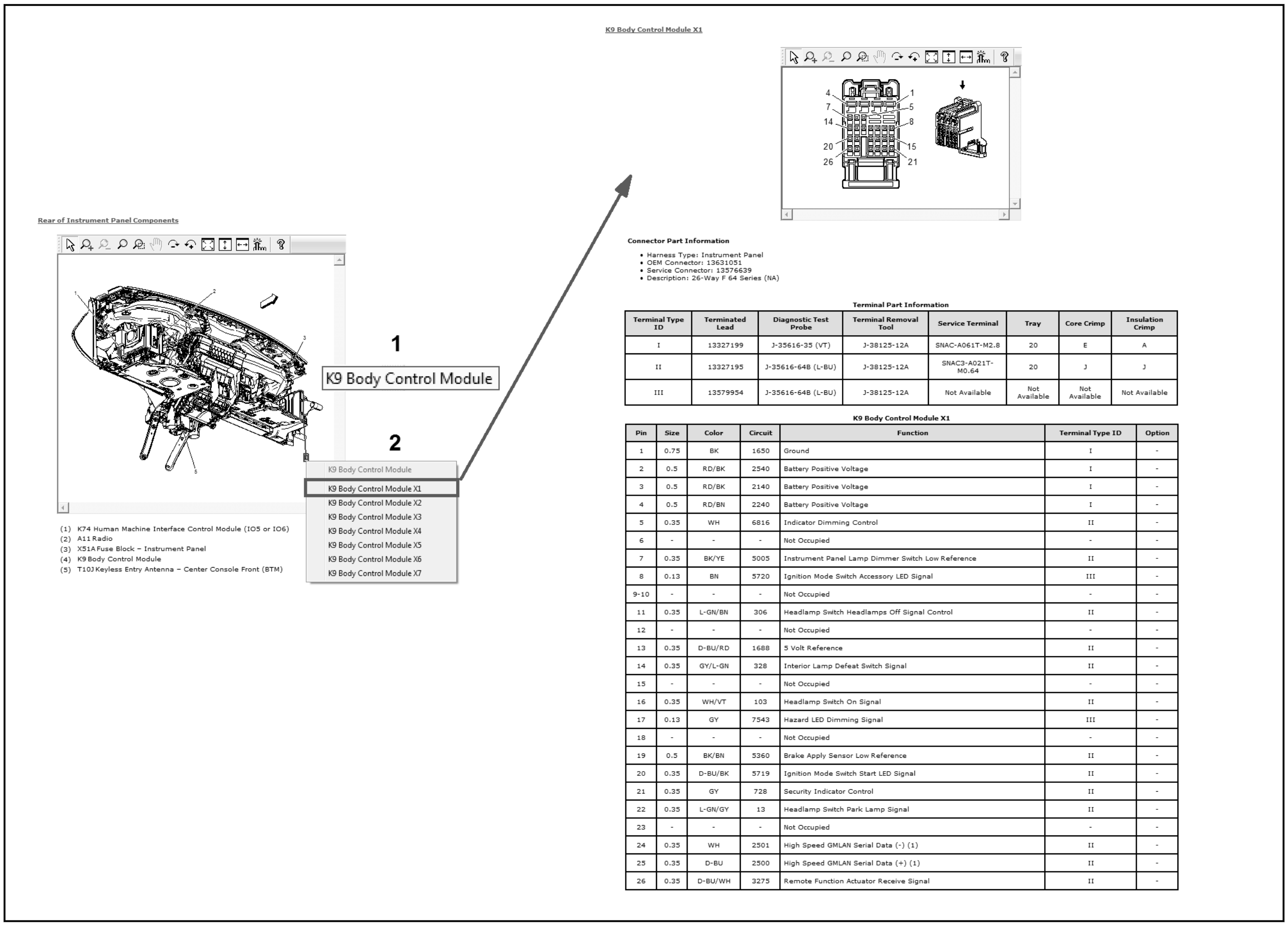
Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	0.75	BK	1650	Ground	I	-
2	0.5	RD/BK	2540	Battery Positive Voltage	I	-
3	0.5	RD/BK	2140	Battery Positive Voltage	I	-
4	0.5	RD/BN	2240	Battery Positive Voltage	I	-
5	0.35	WH	6816	Indicator Dimming Control	II	-
6	-	-	-	Not Occupied	-	-
7	0.35	BK/YE	5005	Instrument Panel Lamp Dimmer Switch Low Reference	II	-
8	0.13	BN	5720	Ignition Mode Switch Accessory LED Signal	III	-
9-10	-	-	-	Not Occupied	-	-
11	0.35	L-GN/BN	306	Headlamp Switch Headlamps Off Signal Control	II	-
12	-	-	-	Not Occupied	-	-
13	0.35	D-BU/RD	1688	5 Volt Reference	II	-
14	0.35	GY/L-GN	328	Interior Lamp Defeat Switch Signal	II	-
15	-	-	-	Not Occupied	-	-
16	0.35	WH/VT	103	Headlamp Switch On Signal	II	-
17	0.13	GY	7543	Hazard LED Dimming Signal	III	-
18	-	-	-	Not Occupied	-	-
19	0.5	BK/BN	5360	Brake Apply Sensor Low Reference	II	-
20	0.35	D-BU/BK	5719	Ignition Mode Switch Start LED Signal	II	-
21	0.35	GY	728	Security Indicator Control	II	-
22	0.35	L-GN/GY	13	Headlamp Switch Park Lamp Signal	II	-
23	-	-	-	Not Occupied	-	-
24	0.35	WH	2501	High Speed GMLAN Serial Data (-) (1)	II	-
25	0.35	D-BU	2500	High Speed GMLAN Serial Data (+) (1)	II	-
26	0.35	D-BU/WH	3275	Remote Function Actuator Receive Signal	II	-

3819951

1. **Mouse-over:** Displays all of the pinout table information for each column including Pin, Size, Color, Circuit, Function, Terminal Type ID, and Option. Note, that not used/not occupied cavities will not have a mouse-over at all. For not used/not occupied cavities, the connector graphic will appear to have a mouse-over, but no information will be displayed in a pop-up menu.
2. **Hotspot Link to Information:** None at this time. A future update may include links to individual subsystem schematic(s) for each circuit.

Component Locator Views

Component locator views now have links to component connector end views.


1
K9 Body Control Module
2
K9 Body Control Module
K9 Body Control Module X1
K9 Body Control Module X2
K9 Body Control Module X3
K9 Body Control Module X4
K9 Body Control Module X5
K9 Body Control Module X6
K9 Body Control Module X7
1
2
3
5
4
7
14
20
26
1
5
8
15
21

Rear of Instrument Panel Components

(1) K74 Human Machine Interface Control Module (IO5 or IO6)
(2) A11 Radio
(3) X51A Fuse Block – Instrument Panel
(4) K9 Body Control Module
(5) T10J Keyless Entry Antenna – Center Console Front (BTM)

K9 Body Control Module X1

Connector Part Information

- Harness Type: Instrument Panel
- OEM Connector: 13631051
- Service Connector: 13576639
- Description: 26-Way F 64 Series (NA)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool	Service Terminal	Tray	Core Crimp	Insulation Crimp
I	13327199	J-35616-35 (VT)	J-38125-12A	SNAC-A061T-M2.8	20	E	A
II	13327195	J-35616-64B (L-BU)	J-38125-12A	SNAC3-A021T-M0.64	20	J	J
III	13579954	J-35616-64B (L-BU)	J-38125-12A	Not Available	Not Available	Not Available	Not Available

K9 Body Control Module X1

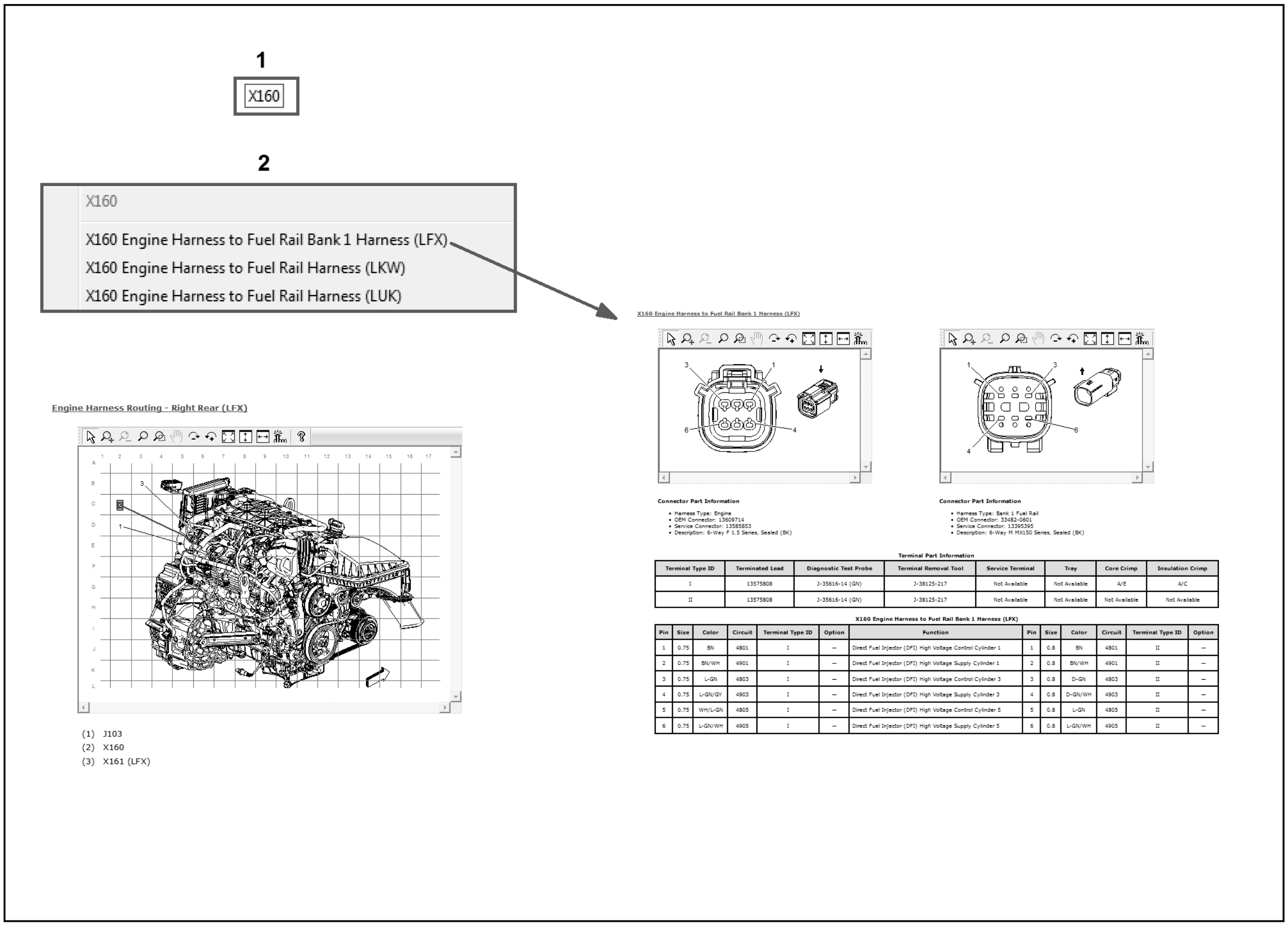
Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	0.75	BK	1650	Ground	I	-
2	0.5	RD/BK	2540	Battery Positive Voltage	I	-
3	0.5	RD/BK	2140	Battery Positive Voltage	I	-
4	0.5	RD/BN	2240	Battery Positive Voltage	I	-
5	0.35	WH	6816	Indicator Dimming Control	II	-
6	-	-	-	Not Occupied	-	-
7	0.35	BK/YE	5005	Instrument Panel Lamp Dimmer Switch Low Reference	II	-
8	0.13	BN	5720	Ignition Mode Switch Accessory LED Signal	III	-
9-10	-	-	-	Not Occupied	-	-
11	0.35	L-GN/BN	306	Headlamp Switch Headlamps Off Signal Control	II	-
12	-	-	-	Not Occupied	-	-
13	0.35	D-BU/RD	1688	5 Volt Reference	II	-
14	0.35	GY/L-GN	328	Interior Lamp Defeat Switch Signal	II	-
15	-	-	-	Not Occupied	-	-
16	0.35	WH/VT	103	Headlamp Switch On Signal	II	-
17	0.13	GY	7543	Hazard LED Dimming Signal	III	-
18	-	-	-	Not Occupied	-	-
19	0.5	BK/BN	5360	Brake Apply Sensor Low Reference	II	-
20	0.35	D-BU/BK	5719	Ignition Mode Switch Start LED Signal	II	-
21	0.35	GY	728	Security Indicator Control	II	-
22	0.35	L-GN/GY	13	Headlamp Switch Park Lamp Signal	II	-
23	-	-	-	Not Occupied	-	-
24	0.35	WH	2501	High Speed GMLAN Serial Data (-) (1)	II	-
25	0.35	D-BU	2500	High Speed GMLAN Serial Data (+) (1)	II	-
26	0.35	D-BU/WH	3275	Remote Function Actuator Receive Signal	II	-

3819952

1. **Mouse-over:** Displays the code and name of the component.
2. **Hotspot Link to Information:** Links to individual connector end view(s) within Component Connector End Views.

Harness Routing Views

Harness routing views now have links to splice pack and inline harness connector end views.


1
X160
2
X160
X160 Engine Harness to Fuel Rail Bank 1 Harness (LFX)
X160 Engine Harness to Fuel Rail Harness (LKW)
X160 Engine Harness to Fuel Rail Harness (LUK)
A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
3
1
6
4

Engine Harness Routing - Right Rear (LFX)

(1) J103
(2) X160
(3) X161 (LFX)

X160 Engine Harness to Fuel Rail Bank 1 Harness (LFX)

Connector Part Information

- Harness Type: Engine
- OEM Connector: 13609714
- Service Connector: 13585853
- Description: 6-Way F 1.5 Series, Sealed (BK)

Connector Part Information

- Harness Type: Bank 1 Fuel Rail
- OEM Connector: 33482-0601
- Service Connector: 13395395
- Description: 6-Way M MX150 Series, Sealed (BK)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool	Service Terminal	Tray	Core Crimp	Insulation Crimp
I	13575808	J-35616-14 (GN)	J-38125-217	Not Available	Not Available	A/E	A/C
II	13575808	J-35616-14 (GN)	J-38125-217	Not Available	Not Available	Not Available	Not Available

X160 Engine Harness to Fuel Rail Bank 1 Harness (LFX)

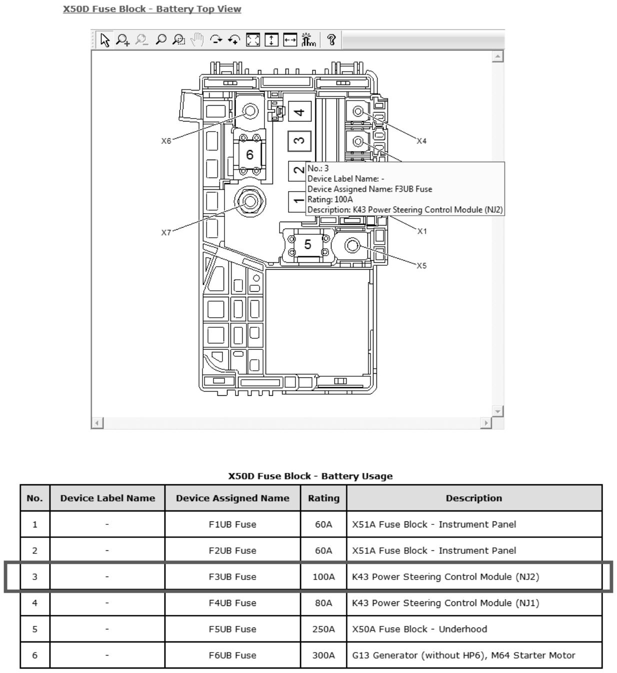
Pin	Size	Color	Circuit	Terminal Type ID	Option	Function	Pin	Size	Color	Circuit	Terminal Type ID	Option
1	0.75	BN	4801	I	–	Direct Fuel Injector (DFI) High Voltage Control Cylinder 1	1	0.8	BN	4801	II	–
2	0.75	BN/WH	4901	I	–	Direct Fuel Injector (DFI) High Voltage Supply Cylinder 1	2	0.8	BN/WH	4901	II	–
3	0.75	L-GN	4803	I	–	Direct Fuel Injector (DFI) High Voltage Control Cylinder 3	3	0.8	D-GN	4803	II	–
4	0.75	L-GN/GY	4903	I	–	Direct Fuel Injector (DFI) High Voltage Supply Cylinder 3	4	0.8	D-GN/WH	4903	II	–
5	0.75	WH/L-GN	4805	I	–	Direct Fuel Injector (DFI) High Voltage Control Cylinder 5	5	0.8	L-GN	4805	II	–
6	0.75	L-GN/WH	4905	I	–	Direct Fuel Injector (DFI) High Voltage Supply Cylinder 5	6	0.8	L-GN/WH	4905	II	–

3819958

1. **Mouse-over:** Displays the code of the harness item.
2. **Hotspot Link to Information:** Links to individual splice pack connector end view(s) within Splice Pack Connector End Views for splice packs and to the individual inline harness connector end view(s) within Inline Harness Connector End Views for inline harness connectors.

Electrical Center Identification Views

Electrical center identification views (top and bottom/ front and back) graphics now have mouse-overs to show the function details of each of utilized devices. Note that the label view will not have any mouse-overs or links at all.



X50D Fuse Block - Battery Top View

No.: 3
Device Label Name: -
Device Assigned Name: F3UB Fuse
Rating: 100A
Description: K43 Power Steering Control Module (NJ2)

X50D Fuse Block - Battery Usage

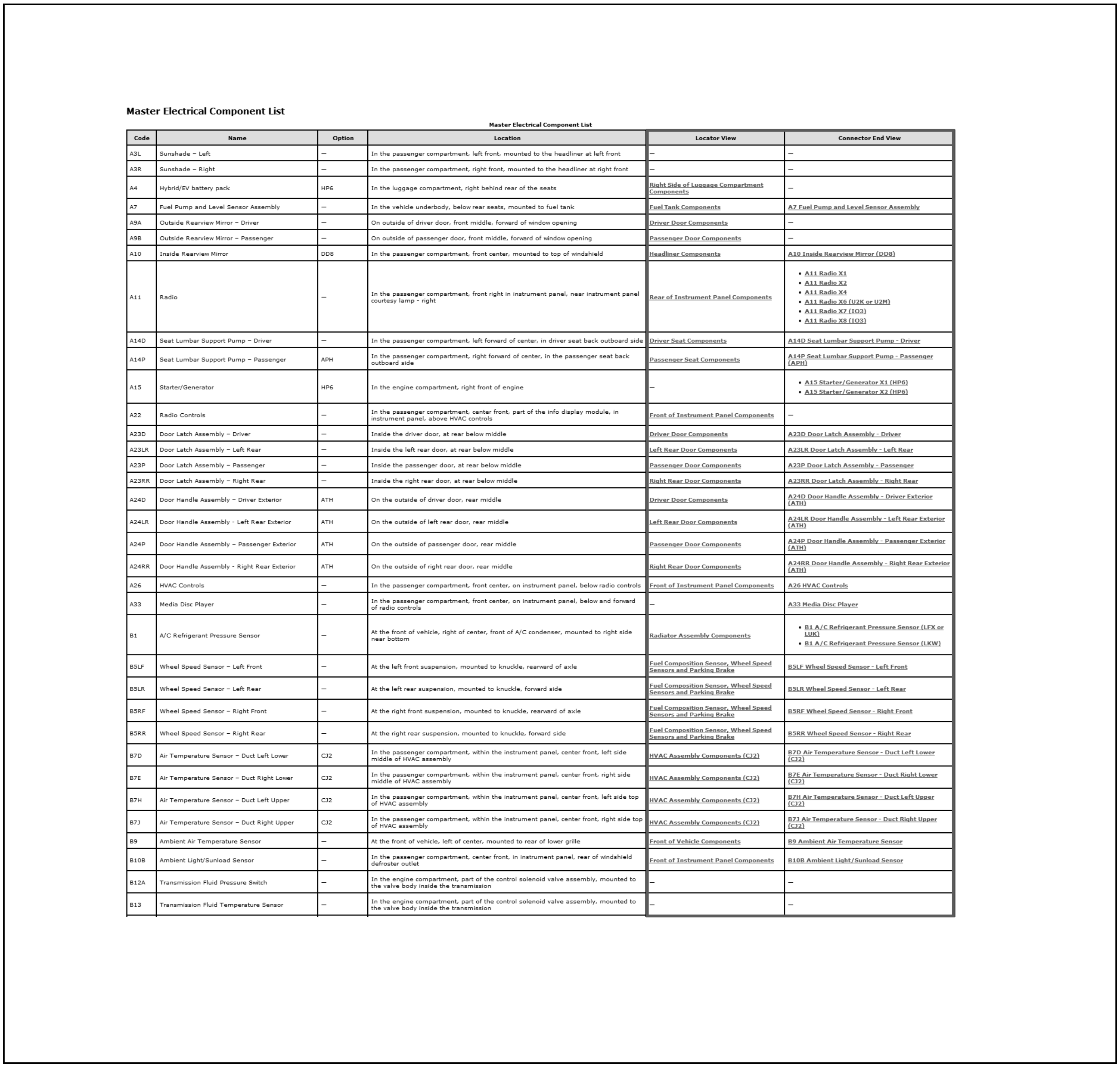
No.	Device Label Name	Device Assigned Name	Rating	Description
1	-	F1UB Fuse	60A	X51A Fuse Block - Instrument Panel
2	-	F2UB Fuse	60A	X51A Fuse Block - Instrument Panel
3	-	F3UB Fuse	100A	K43 Power Steering Control Module (NJ2)
4	-	F4UB Fuse	80A	K43 Power Steering Control Module (NJ1)
5	-	F5UB Fuse	250A	X50A Fuse Block - Underhood
6	-	F6UB Fuse	300A	G13 Generator (without HP6), M64 Starter Motor

3820005

1. **Mouse-over:** Displays all of the usage table information for each column including No., Device Label Name, Device Assigned Name, Rating, and Description. Note, that not used/not occupied devices will not have a mouse-over at all. For not used/not occupied devices, the device graphic may appear to have a mouse-over, but no information will be displayed in a pop-up screen.
2. **Hotspot Link to Information:** None at this time.

Master Electrical Component List

While the master electrical component list format has not changed, it will continue to have links to component locator, harness routing, and connector end views for each of the available electrical devices within the vehicle.



Master Electrical Component List

Master Electrical Component List

Code	Name	Option	Location	Locator View	Connector End View
A3L	Sunshade – Left	—	In the passenger compartment, left front, mounted to the headliner at left front	—	—
A3R	Sunshade – Right	—	In the passenger compartment, right front, mounted to the headliner at right front	—	—
A4	Hybrid/EV battery pack	HP6	In the luggage compartment, right behind rear of the seats	Right Side of Luggage Compartment Components	—
A7	Fuel Pump and Level Sensor Assembly	—	In the vehicle underbody, below rear seats, mounted to fuel tank	Fuel Tank Components	A7 Fuel Pump and Level Sensor Assembly
A9A	Outside Rearview Mirror – Driver	—	On outside of driver door, front middle, forward of window opening	Driver Door Components	—
A9B	Outside Rearview Mirror – Passenger	—	On outside of passenger door, front middle, forward of window opening	Passenger Door Components	—
A10	Inside Rearview Mirror	DD8	In the passenger compartment, front center, mounted to top of windshield	Headliner Components	A10 Inside Rearview Mirror (DD8)
A11	Radio	—	In the passenger compartment, front right in instrument panel, near instrument panel courtesy lamp - right	Rear of Instrument Panel Components	• A11 Radio X1 • A11 Radio X2 • A11 Radio X4 • A11 Radio X6 (U2K or U2M) • A11 Radio X7 (IO3) • A11 Radio X8 (IO3)
A14D	Seat Lumbar Support Pump – Driver	—	In the passenger compartment, left forward of center, in driver seat back outboard side	Driver Seat Components	A14D Seat Lumbar Support Pump - Driver
A14P	Seat Lumbar Support Pump – Passenger	APH	In the passenger compartment, right forward of center, in the passenger seat back outboard side	Passenger Seat Components	A14P Seat Lumbar Support Pump - Passenger (APH)
A15	Starter/Generator	HP6	In the engine compartment, right front of engine	—	• A15 Starter/Generator X1 (HP6) • A15 Starter/Generator X2 (HP6)
A22	Radio Controls	—	In the passenger compartment, center front, part of the info display module, in instrument panel, above HVAC controls	Front of Instrument Panel Components	—
A23D	Door Latch Assembly – Driver	—	Inside the driver door, at rear below middle	Driver Door Components	A23D Door Latch Assembly - Driver
A23LR	Door Latch Assembly – Left Rear	—	Inside the left rear door, at rear below middle	Left Rear Door Components	A23LR Door Latch Assembly - Left Rear
A23P	Door Latch Assembly – Passenger	—	Inside the passenger door, at rear below middle	Passenger Door Components	A23P Door Latch Assembly - Passenger
A23RR	Door Latch Assembly – Right Rear	—	Inside the right rear door, at rear below middle	Right Rear Door Components	A23RR Door Latch Assembly - Right Rear
A24D	Door Handle Assembly – Driver Exterior	ATH	On the outside of driver door, rear middle	Driver Door Components	A24D Door Handle Assembly - Driver Exterior (ATH)
A24LR	Door Handle Assembly - Left Rear Exterior	ATH	On the outside of left rear door, rear middle	Left Rear Door Components	A24LR Door Handle Assembly - Left Rear Exterior (ATH)
A24P	Door Handle Assembly – Passenger Exterior	ATH	On the outside of passenger door, rear middle	Passenger Door Components	A24P Door Handle Assembly - Passenger Exterior (ATH)
A24RR	Door Handle Assembly - Right Rear Exterior	ATH	On the outside of right rear door, rear middle	Right Rear Door Components	A24RR Door Handle Assembly - Right Rear Exterior (ATH)
A26	HVAC Controls	—	In the passenger compartment, front center, on instrument panel, below radio controls	Front of Instrument Panel Components	A26 HVAC Controls
A33	Media Disc Player	—	In the passenger compartment, front center, on instrument panel, below and forward of radio controls	—	A33 Media Disc Player
B1	A/C Refrigerant Pressure Sensor	—	At the front of vehicle, right of center, front of A/C condenser, mounted to right side near bottom	Radiator Assembly Components	• B1 A/C Refrigerant Pressure Sensor (LFX or LUK) • B1 A/C Refrigerant Pressure Sensor (LKW)
B5LF	Wheel Speed Sensor – Left Front	—	At the left front suspension, mounted to knuckle, rearward of axle	Fuel Composition Sensor, Wheel Speed Sensors and Parking Brake	B5LF Wheel Speed Sensor - Left Front
B5LR	Wheel Speed Sensor – Left Rear	—	At the left rear suspension, mounted to knuckle, forward side	Fuel Composition Sensor, Wheel Speed Sensors and Parking Brake	B5LR Wheel Speed Sensor - Left Rear
B5RF	Wheel Speed Sensor – Right Front	—	At the right front suspension, mounted to knuckle, rearward of axle	Fuel Composition Sensor, Wheel Speed Sensors and Parking Brake	B5RF Wheel Speed Sensor - Right Front
B5RR	Wheel Speed Sensor – Right Rear	—	At the right rear suspension, mounted to knuckle, forward side	Fuel Composition Sensor, Wheel Speed Sensors and Parking Brake	B5RR Wheel Speed Sensor - Right Rear
B7D	Air Temperature Sensor – Duct Left Lower	CJ2	In the passenger compartment, within the instrument panel, center front, left side middle of HVAC assembly	HVAC Assembly Components (CJ2)	B7D Air Temperature Sensor - Duct Left Lower (CJ2)
B7E	Air Temperature Sensor – Duct Right Lower	CJ2	In the passenger compartment, within the instrument panel, center front, right side middle of HVAC assembly	HVAC Assembly Components (CJ2)	B7E Air Temperature Sensor - Duct Right Lower (CJ2)
B7H	Air Temperature Sensor – Duct Left Upper	CJ2	In the passenger compartment, within the instrument panel, center front, left side top of HVAC assembly	HVAC Assembly Components (CJ2)	B7H Air Temperature Sensor - Duct Left Upper (CJ2)
B7J	Air Temperature Sensor – Duct Right Upper	CJ2	In the passenger compartment, within the instrument panel, center front, right side top of HVAC assembly	HVAC Assembly Components (CJ2)	B7J Air Temperature Sensor - Duct Right Upper (CJ2)
B9	Ambient Air Temperature Sensor	—	At the front of vehicle, left of center, mounted to rear of lower grille	Front of Vehicle Components	B9 Ambient Air Temperature Sensor
B10B	Ambient Light/Sunload Sensor	—	In the passenger compartment, center front, in instrument panel, rear of windshield defroster outlet	Front of Instrument Panel Components	B10B Ambient Light/Sunload Sensor
B12A	Transmission Fluid Pressure Switch	—	In the engine compartment, part of the control solenoid valve assembly, mounted to the valve body inside the transmission	—	—
B13	Transmission Fluid Temperature Sensor	—	In the engine compartment, part of the control solenoid valve assembly, mounted to the valve body inside the transmission	—	—

3820020

1. **Mouse-over:** None at this time.
2. **Hotspot Link to Information:**
   - ⇒ A future update may include links to individual subsystem schematic(s) for each component/ harness item.
   - ⇒ **Components**
     - − Links to individual locator view within one of the eight component view categories and will show where the component is located in the vehicle.
     - − Links to individual connector end view(s) within Component Connector End Views.
   - ⇒ **Electrical Centers (Fuse Blocks)**
     - − Links to individual locator view within one of the eight component view categories and will show where the component is located in the vehicle.
     - − Links to individual connector end view(s) within Electrical Center Identification Views.
   - ⇒ **Inline Harness Connectors**
     - − Links to individual harness routing view(s) within Harness Routing Views and will show where the harness item is located on the vehicle harness.
     - − Links to individual connector end view(s) within Inline Harness Connector End Views.
   - ⇒ **Grounds**

- Links to individual locator view within Ground Views component view and will show where the ground is located in the vehicle.

⇒ **Splices**

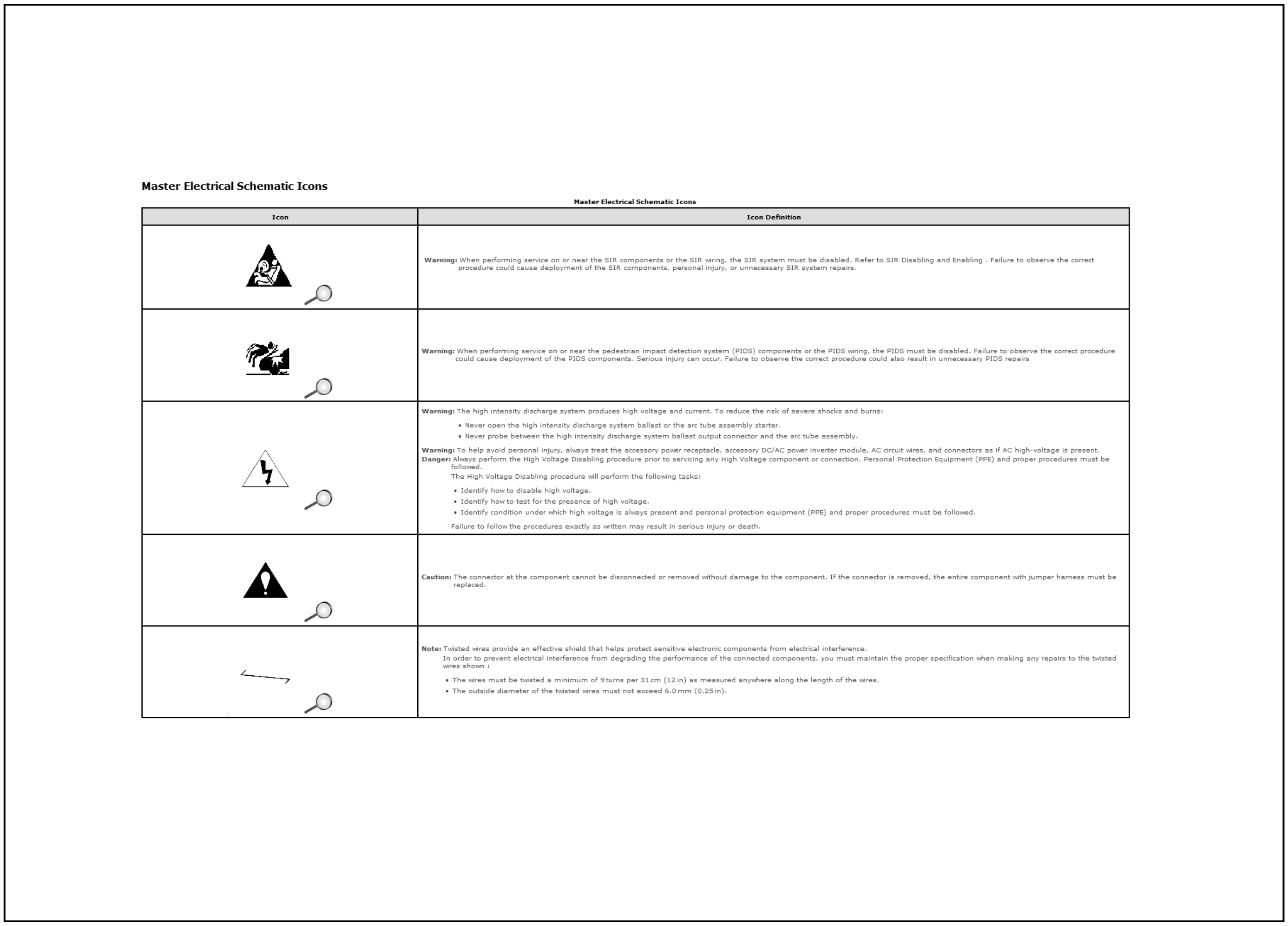
- Links to individual harness routing view(s) within Harness Routing Views and will show where the harness item is located on the vehicle harness.

⇒ **Splice Packs**

- Links to individual harness routing view(s) within Harness Routing Views and will show where the harness item is located on the vehicle harness.
- Links to individual connector end view(s) within Splice Pack Connector End Views.

Master Electrical Schematic Icons

While the master electrical schematic icons list format has not changed, it will continue to include icons used in the vehicle schematics along with the message for the icon.



Master Electrical Schematic Icons

Master Electrical Schematic Icons

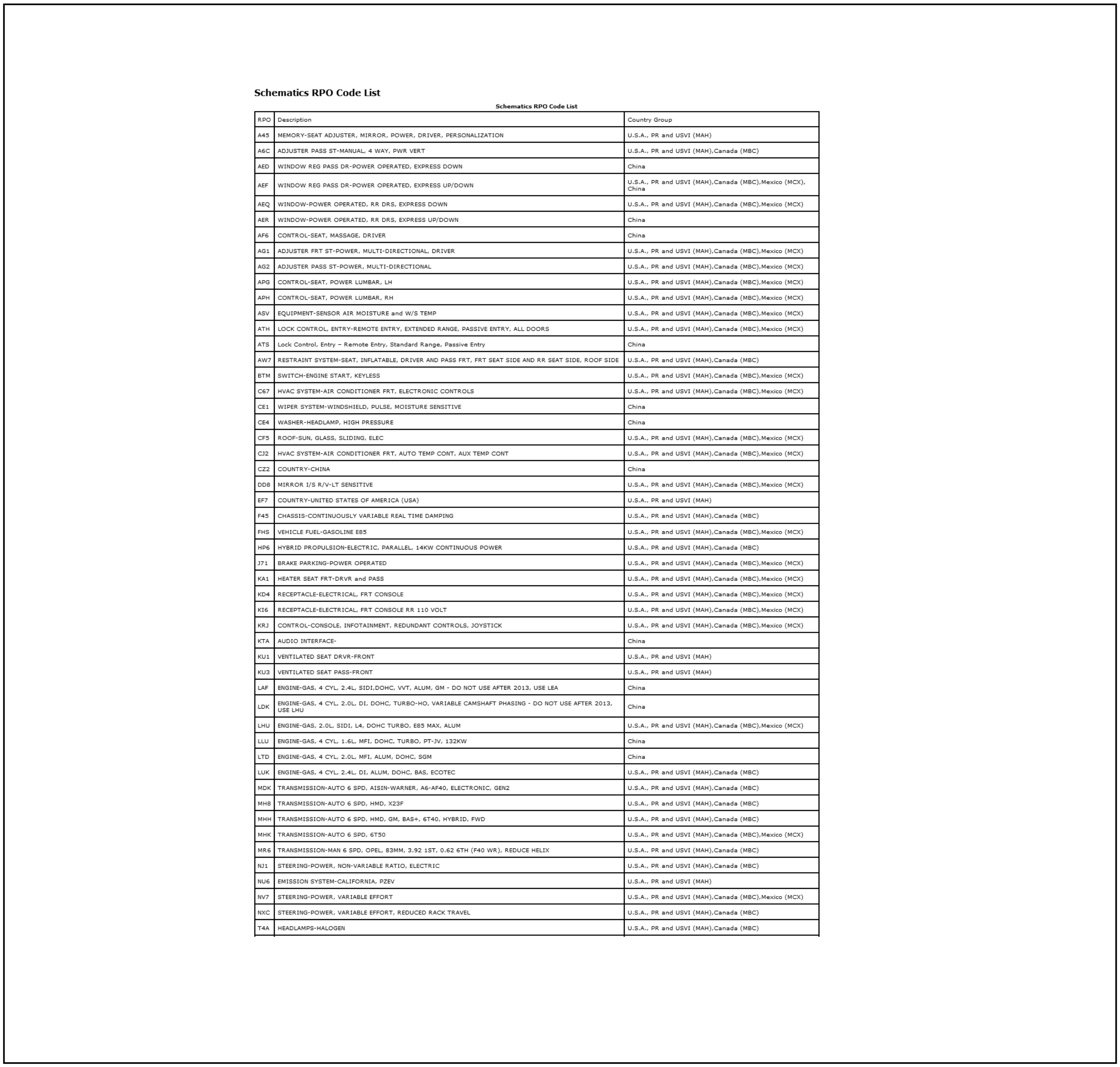
Icon	Icon Definition
⚠	**Warning:** When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling . Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.
	Warning: When performing service on or near the pedestrian impact detection system (PIDS) components or the PIDS wiring, the PIDS must be disabled. Failure to observe the correct procedure could cause deployment of the PIDS components. Serious injury can occur. Failure to observe the correct procedure could also result in unnecessary PIDS repairs
⚡	**Warning:** The high intensity discharge system produces high voltage and current. To reduce the risk of severe shocks and burns: • Never open the high intensity discharge system ballast or the arc tube assembly starter. • Never probe between the high intensity discharge system ballast output connector and the arc tube assembly. **Warning:** To help avoid personal injury, always treat the accessory power receptacle, accessory DC/AC power inverter module, AC circuit wires, and connectors as if AC high-voltage is present. **Danger:** Always perform the High Voltage Disabling procedure prior to servicing any High Voltage component or connection. Personal Protection Equipment (PPE) and proper procedures must be followed. The High Voltage Disabling procedure will perform the following tasks: • Identify how to disable high voltage. • Identify how to test for the presence of high voltage. • Identify condition under which high voltage is always present and personal protection equipment (PPE) and proper procedures must be followed. Failure to follow the procedures exactly as written may result in serious injury or death.
⚠	**Caution:** The connector at the component cannot be disconnected or removed without damage to the component. If the connector is removed, the entire component with jumper harness must be replaced.
	Note: Twisted wires provide an effective shield that helps protect sensitive electronic components from electrical interference. In order to prevent electrical interference from degrading the performance of the connected components, you must maintain the proper specification when making any repairs to the twisted wires shown : • The wires must be twisted a minimum of 9 turns per 31 cm (12 in) as measured anywhere along the length of the wires. • The outside diameter of the twisted wires must not exceed 6.0 mm (0.25 in).

3820510

1. **Mouse-over:** None at this time.
2. **Hotspot Link to Information:** None at this time.

Schematic RPO Code List

The schematic RPO code list only includes RPOs shown in schematics and also includes the country groupings for the options. This list is in addition to the vehicle RPO Code List that is included in General Information.



Schematics RPO Code List

Schematics RPO Code List

RPO	Description	Country Group
A45	MEMORY-SEAT ADJUSTER, MIRROR, POWER, DRIVER, PERSONALIZATION	U.S.A., PR and USVI (MAH)
A6C	ADJUSTER PASS ST-MANUAL, 4 WAY, PWR VERT	U.S.A., PR and USVI (MAH),Canada (MBC)
AED	WINDOW REG PASS DR-POWER OPERATED, EXPRESS DOWN	China
AEF	WINDOW REG PASS DR-POWER OPERATED, EXPRESS UP/DOWN	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX), China
AEQ	WINDOW-POWER OPERATED, RR DRS, EXPRESS DOWN	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
AER	WINDOW-POWER OPERATED, RR DRS, EXPRESS UP/DOWN	China
AF6	CONTROL-SEAT, MASSAGE, DRIVER	China
AG1	ADJUSTER FRT ST-POWER, MULTI-DIRECTIONAL, DRIVER	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
AG2	ADJUSTER PASS ST-POWER, MULTI-DIRECTIONAL	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
APG	CONTROL-SEAT, POWER LUMBAR, LH	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
APH	CONTROL-SEAT, POWER LUMBAR, RH	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
ASV	EQUIPMENT-SENSOR AIR MOISTURE and W/S TEMP	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
ATH	LOCK CONTROL, ENTRY-REMOTE ENTRY, EXTENDED RANGE, PASSIVE ENTRY, ALL DOORS	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
ATS	Lock Control, Entry – Remote Entry, Standard Range, Passive Entry	China
AW7	RESTRAINT SYSTEM-SEAT, INFLATABLE, DRIVER AND PASS FRT, FRT SEAT SIDE AND RR SEAT SIDE, ROOF SIDE	U.S.A., PR and USVI (MAH),Canada (MBC)
BTM	SWITCH-ENGINE START, KEYLESS	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
C67	HVAC SYSTEM-AIR CONDITIONER FRT, ELECTRONIC CONTROLS	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
CE1	WIPER SYSTEM-WINDSHIELD, PULSE, MOISTURE SENSITIVE	China
CE4	WASHER-HEADLAMP, HIGH PRESSURE	China
CF5	ROOF-SUN, GLASS, SLIDING, ELEC	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
CJ2	HVAC SYSTEM-AIR CONDITIONER FRT, AUTO TEMP CONT, AUX TEMP CONT	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
CZ2	COUNTRY-CHINA	China
DD8	MIRROR I/S R/V-LT SENSITIVE	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
EF7	COUNTRY-UNITED STATES OF AMERICA (USA)	U.S.A., PR and USVI (MAH)
F45	CHASSIS-CONTINUOUSLY VARIABLE REAL TIME DAMPING	U.S.A., PR and USVI (MAH),Canada (MBC)
FHS	VEHICLE FUEL-GASOLINE E85	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
HP6	HYBRID PROPULSION-ELECTRIC, PARALLEL, 14KW CONTINUOUS POWER	U.S.A., PR and USVI (MAH),Canada (MBC)
J71	BRAKE PARKING-POWER OPERATED	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
KA1	HEATER SEAT FRT-DRVR and PASS	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
KD4	RECEPTACLE-ELECTRICAL, FRT CONSOLE	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
KI6	RECEPTACLE-ELECTRICAL, FRT CONSOLE RR 110 VOLT	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
KRJ	CONTROL-CONSOLE, INFOTAINMENT, REDUNDANT CONTROLS, JOYSTICK	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
KTA	AUDIO INTERFACE-	China
KU1	VENTILATED SEAT DRVR-FRONT	U.S.A., PR and USVI (MAH)
KU3	VENTILATED SEAT PASS-FRONT	U.S.A., PR and USVI (MAH)
LAF	ENGINE-GAS, 4 CYL, 2.4L, SIDI,DOHC, VVT, ALUM, GM - DO NOT USE AFTER 2013, USE LEA	China
LDK	ENGINE-GAS, 4 CYL, 2.0L, DI, DOHC, TURBO-HO, VARIABLE CAMSHAFT PHASING - DO NOT USE AFTER 2013, USE LHU	China
LHU	ENGINE-GAS, 2.0L, SIDI, L4, DOHC TURBO, E85 MAX, ALUM	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
LLU	ENGINE-GAS, 4 CYL, 1.6L, MFI, DOHC, TURBO, PT-JV, 132KW	China
LTD	ENGINE-GAS, 4 CYL, 2.0L, MFI, ALUM, DOHC, SGM	China
LUK	ENGINE-GAS, 4 CYL, 2.4L, DI, ALUM, DOHC, BAS, ECOTEC	U.S.A., PR and USVI (MAH),Canada (MBC)
MDK	TRANSMISSION-AUTO 6 SPD, AISIN-WARNER, A6-AF40, ELECTRONIC, GEN2	U.S.A., PR and USVI (MAH),Canada (MBC)
MH8	TRANSMISSION-AUTO 6 SPD, HMD, X23F	U.S.A., PR and USVI (MAH),Canada (MBC)
MHH	TRANSMISSION-AUTO 6 SPD, HMD, GM, BAS+, 6T40, HYBRID, FWD	U.S.A., PR and USVI (MAH),Canada (MBC)
MHK	TRANSMISSION-AUTO 6 SPD, 6T50	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
MR6	TRANSMISSION-MAN 6 SPD, OPEL, 83MM, 3.92 1ST, 0.62 6TH (F40 WR), REDUCE HELIX	U.S.A., PR and USVI (MAH),Canada (MBC)
NJ1	STEERING-POWER, NON-VARIABLE RATIO, ELECTRIC	U.S.A., PR and USVI (MAH),Canada (MBC)
NU6	EMISSION SYSTEM-CALIFORNIA, PZEV	U.S.A., PR and USVI (MAH)
NV7	STEERING-POWER, VARIABLE EFFORT	U.S.A., PR and USVI (MAH),Canada (MBC),Mexico (MCX)
NXC	STEERING-POWER, VARIABLE EFFORT, REDUCED RACK TRAVEL	U.S.A., PR and USVI (MAH),Canada (MBC)
T4A	HEADLAMPS-HALOGEN	U.S.A., PR and USVI (MAH),Canada (MBC)

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1. **Mouse-over:** None at this time.
2. **Hotspot Link to Information:** None at this time.

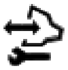
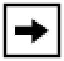
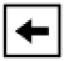
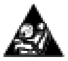
Electrical Schematic Symbols

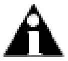
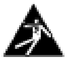
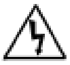
Voltage Indicators

Symbol	Description
B+ 1988677	Battery Voltage
IGN 0 1988679	Ignition Switch– Off Position
IGN I 1988682	Ignition Switch– Accessory Position
IGN II 1988686	Ignition Switch– Run Position
IGN II 1988691	Ignition Switch– Start Position

General Icons

Symbol	Description
LOC 1990537	Master Component List Icon This icon is used on the schematic to link to the Master Electrical Component List.
DESC 1990538	Description and Operation Icon This icon is used on the schematic to link to the Description and Operation of that particular system.

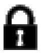
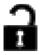
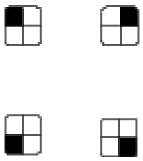
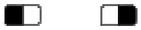
Symbol	Description
 1988674	Computer Programming Icon This icon is used on the schematic to link to Control Module References, which identifies which components need programming upon replacement.
 1990541	Next Schematic Page Icon This icon is used on the schematic to navigate to the next schematic in the subsystem.
 1990542	Previous Schematic Page Icon This icon is used on the schematic to navigate to the previous schematic in the subsystem.
 1988667	Supplemental Inflatable Restraint (SIR) or Supplemental Restraint System (SRS) Icon This icon is used to alert the technician that the system contains SIR/SRS components that require certain precautions before servicing.

Symbol	Description
 1988670	Information Icon This icon is used to alert the technician that there is additional information that will aid in servicing a system.
 1988672	Danger Icon This icon is intended to alert the technician that a component within the system contains labeling with the same icon. This icon is used when a source component has potential for 60 volts DC or greater or has potential for 42 volts AC or greater.
 1988673	High Voltage Icon This icon is intended to alert the technician that a component within the system contains labeling with the same icon. This icon is used when a component/circuit has potential for 60 volts DC or greater or has potential for 42 volts AC or greater.

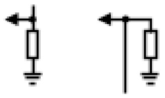
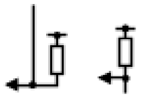
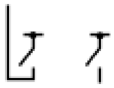
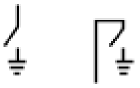
Symbol	Description
⚠ 1990543	Caution Icon This icon is used to advise the technician to use caution when servicing this component. This icon may be used when a component/circuit has a voltage range potential between 30-60 volts DC or 15-42 volts AC.
⇅ 1988675	Functional Serial Data Communication This icon is used to show the technician that the serial data circuit detail is shown incomplete. It also provides an active link to the Data Communication Schematics were the circuit is shown complete.

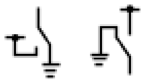
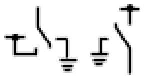
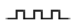
Switch Position Icons

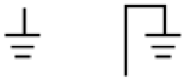
Symbol	Description
↑ ∧ △ 1989016	Generic Up Arrows
↓ ∨ ▽ 1990554	Generic Down Arrows
← < ◁ 1990555	Generic Left Arrows
→ > ▷ 1990556	Generic Right Arrows
↓↓ 1990557	Generic Express Down Arrows
⏻ 1990558	On/Off Icon

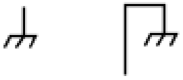
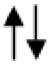
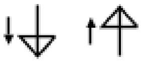
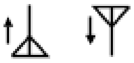
Symbol	Description
 1990559	Generic Lock Icon
 1990560	Generic Unlock Icon
 1989018	Generic Window Switch Positions– 4 Door
 1989020	Generic Window Switch Positions– 2 Door

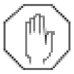
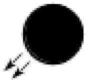
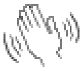
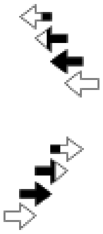
Module Circuit Function Icons

Symbol	Description
 1988774	I/O Pull-Down Resistors (−)
 1990567	I/O Pull-Up Resistors (+)
 1988775	I/O High-Side Drive Switch (+)
 1990568	I/O Low-Side Drive Switch (−)

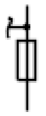
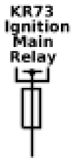
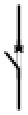
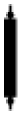
Symbol	Description
 1990570	I/O Bidirectional Switch (+/−)
 6535609	I/O Bidirectional Switch (+/−) Neutral State
 1990571	Pulse-Width Modulation Symbol
B+ 1990573	Battery Voltage

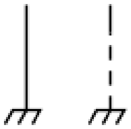
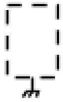
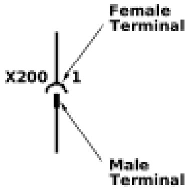
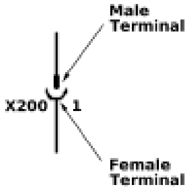
Symbol	Description
IGN 1990574	Ignition Voltage
5V 1990576	Voltage Reference
5V AC 1990577	A/C Voltage
 1988986	Low Reference

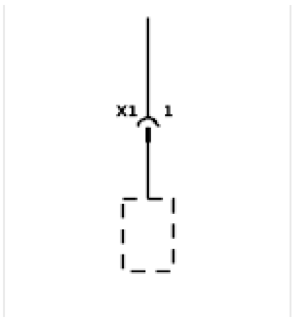
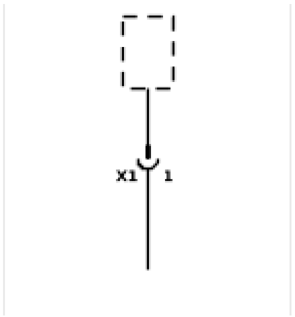
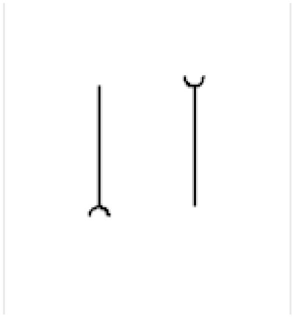
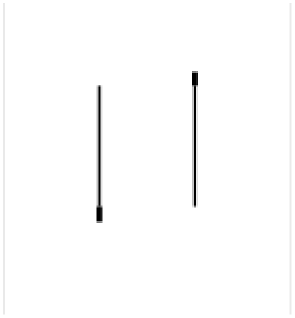
Symbol	Description
 1990578	Ground
 1990579	Serial Data
 1988973	Antenna Signal– In
 1988974	Antenna Signal– Out

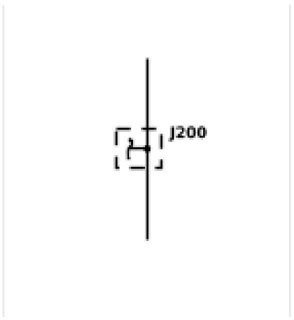
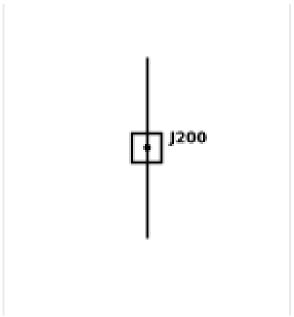
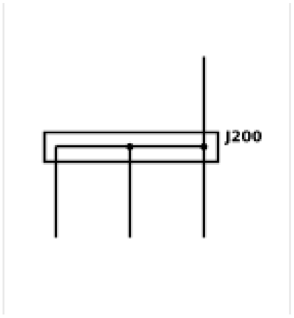
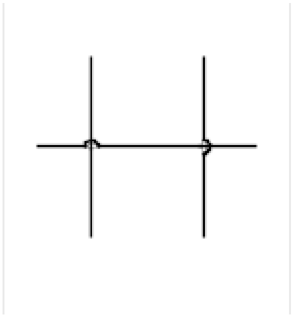
Symbol	Description
 2161152	Brake Apply
 5371975	Bulb Out
 6659366	Approach Lighting Animation
 6659367	Sequential Turn Signal Animation

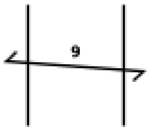
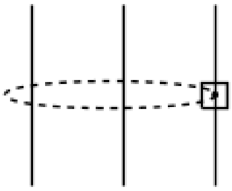
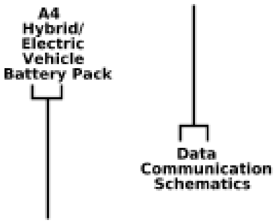
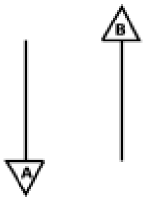
Harness Components

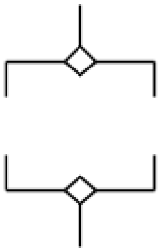
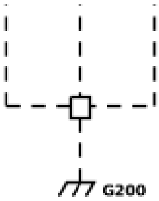
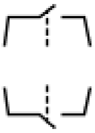
Symbol	Description
 1988731	Fuse
 KR73 Ignition Main Relay 1988733	Fuse Supplied by a Relay
 1988740	Circuit Breaker
 1988745	Fusible Link

Symbol	Description
 1988987	Ground
 1988746	Case Ground
 Female Terminal X200 1 Male Terminal 1988977	Inline Harness Connector
 Male Terminal X200 1 Female Terminal 1990974	Inline Harness Connector

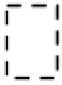
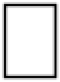
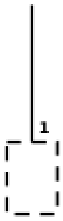
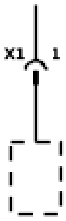
Symbol	Description
 1990975	Pigtail Connection
 1990976	Pigtail Connection
 1990977	Provisional or Diagnostic Connector
 1990978	Blunt Cut Wire

Symbol	Description
 1988980	Incomplete Physical Splice
 1988981	Complete Physical Splice– 2 Wires
 1988982	Complete Physical Splice– 3 or more wires
 1990979	Wire Crosses

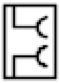
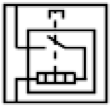
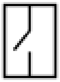
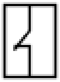
Symbol	Description
 1988988	Twisted Wires
 1988990	Shield
 A4 Hybrid/ Electric Vehicle Battery Pack Data Communication Schematics 1990980	Circuit References
 1990981	Circuit Continuation Arrowheads

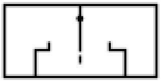
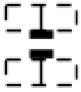
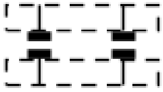
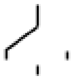
Symbol	Description
 1988983	Option Breakpoint
 1988984	Ground Circuit Connection
 1988985	Connector Shorting Clip

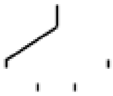
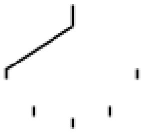
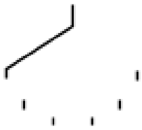
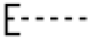
Component Parts

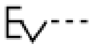
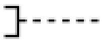
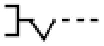
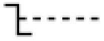
Symbol	Description
 1988694	Partial Component When a component is represented in a dashed box, the component or its wiring is not shown in its entirety.
 1988698	Entire Component When a component is represented in a solid box the component or its wiring is shown in its entirety.
 1988712	Connector Directly Attached to Component
 1988715	Pigtail Connector

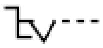
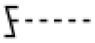
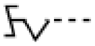
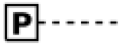
Switches and Relays

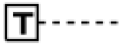
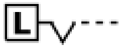
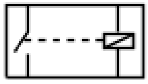
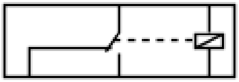
Symbol	Description
 1991015	Accessory Power Outlet
 1991016	Cigar Lighter
 1988991	Switch– 2 Position Normally Open
 1988992	Switch– 2 Position Normally Closed

Symbol	Description
 1988993	Switch– Rocker
 1991017	Switch– Contact Plate (1 Wire)
 1988994	Switch– Contact Plate (2 Wire)
 1991018	Switch– 3 Position

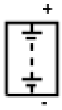
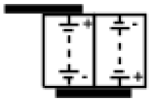
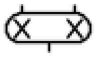
Symbol	Description
 1988995	Switch– 4 Position
 1991019	Switch– 5 Position
 1991021	Switch– 6 Position
 1988997	Switch Actuator– Push (Momentary)

Symbol	Description
 1988998	Switch Actuator– Push (Latching)
 1988999	Switch Actuator– Pull (Momentary)
 1989000	Switch Actuator– Pull (Latching)
 1989001	Switch Actuator– Rotate (Momentary)

Symbol	Description
 1989002	Switch Actuator– Rotate (Latching)
 1989003	Switch Actuator– Slide (Momentary)
 1989004	Switch Actuator– Slide (Latching)
 1989007	Switch Actuator– Pressure (Momentary)

Symbol	Description
 1989010	Switch Actuator– Temperature (Momentary)
 1989013	Switch Actuator– Volume (Latching)
 1988975	4-Pin Single Pole/Throw Relay– Normally Open
 1990539	5-Pin Relay– Normally Closed

Devices and Sensors

Symbol	Description
 1988751	Battery
 1988753	Battery Assembly– Hybrid
 1988717	Single Filament Light Bulb
 1988719	Double Filament Light Bulb

Symbol	Description
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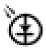
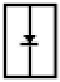
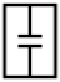
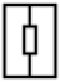
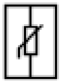
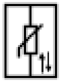
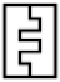
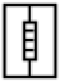
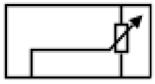
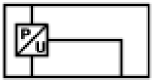
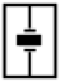
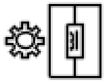
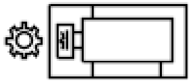
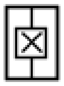
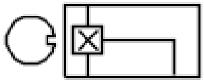
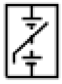
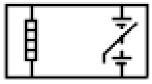
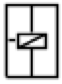
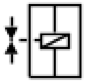
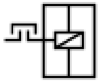
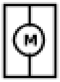
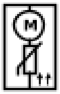
 1988725	Photo Sensor
1990988	Gauge
 1988776	Diode

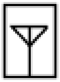
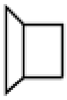
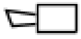
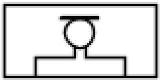
Symbol	Description
 1988748	Capacitor
 1988755	Resistor
 1988759	Variable Resistor
 1990991	Variable Resistor– NTC

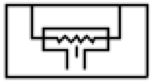
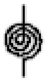
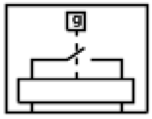
Symbol	Description
 1990992	Breakable Wire
 1988778	Heating Element
 1988771	Position Sensor
 1988773	Pressure Sensor

Symbol	Description
 1990993	Knock Sensor
 1990994	Inductive Type Sensor– 2-Wire
 1990996	Inductive Type Sensor– 3-Wire
 1990998	Hall Effect Sensor– 2-Wire

Symbol	Description
 1990999	Hall Effect Sensor– 3-Wire
 1991000	Oxygen Sensor– 2-Wire
 1991001	Heated Oxygen Sensor– 4-Wire
 1988970	Solenoid– Actuator

Symbol	Description
 1988971	Solenoid– Valve
 1988972	Clutch
 1988779	Motor
 1991003	Motor with PTC

Symbol	Description
 1988729	Antenna
 1991005	Speaker
 1991006	Horn
 1991007	Microphone

Symbol	Description
 1991008	Airbag
 1991009	SIR Coil
 1991010	SIR Impact Sensor

Schematics RPO Code List

Schematics RPO Code List

RPO	Option Name
5Y1	SEAT CENTER-FRONT ROW 20% CENTER SEAT DELETE (SEO)
9L7	EQUIPMENT-ACSRY WRG JUNC BLK
A2X	ADJUSTER DRIVER SEAT-8WAY, PWR RECLINE, PWR FORE/AFT, PWR HEIGHT, PWR TILT

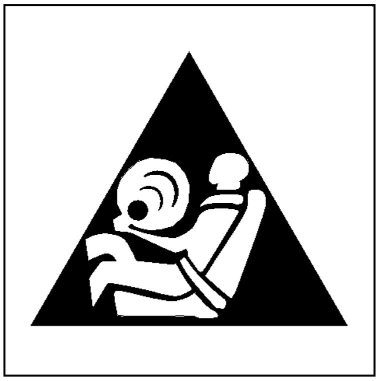
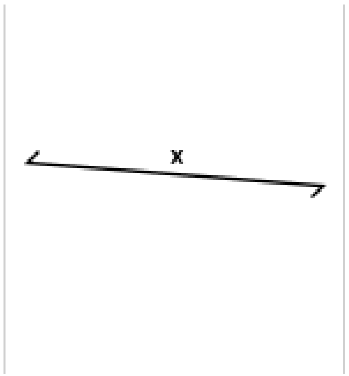
RPO	Option Name
A45	MEMORY-SEAT ADJUSTER, MIRROR, POWER, DRIVER, PERSONALIZATION
A48	WINDOW RR-FULL WIDTH, SLIDING, POWER
A7K	ADJUSTER PASS ST-8WAY, PWR RECLINE, PWR FORE/AFT, PWR HEIGHT, PWR TILT
AED	WINDOW REG PASS DR-POWER OPERATED,EXPRESS DOWN (DO NOT USE NEXT NEW MAJOR)
AEF	WINDOW REG PASS DR-POWER OPERATED, EXPRESS UP/DOWN (DO NOT USE NEXT NEW MAJOR)
AEQ	WINDOW REG REAR DR-POWER OPERATED, EXPRESS DOWN (DO NOT USE NEXT NEW MAJOR)
AL0	SENSOR INDICATOR-INFLATABLE RESTRAINT, FRT PASS/CHILD PRESENCE DETECTOR
AU3	LOCK CONTROL-SIDE DR, ELEC
AVJ	LOCK CONTROL, ENTRY-REMOTE ENTRY, EXTENDED RANGE, PASSIVE ENTRY, FRONT DOORS
AXG	WINDOW REG DRVR DR-POWER OPERATED, EXPRESS UP/DOWN (DO NOT USE NEXT NEW MAJOR)
AZ3	SEAT-FRT SPLIT, DRIVER, PASS, FULL FEATURE CENTER
B3L	STEPS, RUNNINGBOARD-SIDE, RETRACTABLE, POWER, BLACK
BRS	STEPS, RUNNINGBOARD-SIDE, RETRACTABLE, POWER, BRIGHT
C32	HEATER AIR SYSTEM-HEATING/DEFROSTER SYSTEM, REINFORCED, ELECTRIC
C49	DEFOGGER-RR WINDOW, ELECTRIC
C67	HVAC SYSTEM-AIR CONDITIONER FRT, ELECTRONIC CONTROLS
C9I	SWITCH-ROLL OVER SENSING
CE1	WIPER SYS WINDSHIELD-PULSE, MOISTURE SENSITIVE
CF5	ROOF-SUN, GLASS, SLIDING, ELEC (DO NOT USE NEXT NEW MAJOR)
CJ2	HVAC SYSTEM-AIR CONDITIONER FRT, AUTO TEMP CONT, AUX TEMP CONT
D07	CONSOLE-FRT COMPT, FLOOR, CUSTOM
DBG	MIRROR O/S-MAN EXT, PWR ADJ, HEAT, MAN FOLD, TURN SIG, AUX CLR, FLAT DRVR/PASS, WFOV DRVR/PASS
DD8	MIRROR I/S R/V-LT SENSITIVE
DH6	MIRROR I/S FRT VAN-LH and RH, SUNSHADE, ILLUM (DO NOT USE NEXT NEW MAJOR)
DLN	MIRROR O/S-LH and RH, ELEC REMOTE CONTROL, HEATER, MANUAL FOLD, FLAT/DRVR, FLAT/PASS
DRZ	MIRROR I/S R/V-LT SENSITIVE, FULL VIDEO DISPLAY
DWI	MIRROR O/S-LH and RH,WFOV,MAN EXT,PWR FLD,HTD,TURN SIG,R/CON,ELEC,AUX CARGO,AUX CLR,PERM LIGHT,FLAT LT SENS DR/PAS
DZC	MIRROR O/S-LH and RH,WFOV,PWR EXT,PWR FOLD,HTD,TURN SID,R/CON MEM,AUX CARGO,AUX CLR,PERM LT,FLAT LT SENS DR/PAS
DZW	CHASSIS-DUAL REAR WHEEL, RIDE and HANDLING
E63	BODY EQUIPMENT-FLEETSIDE PICK-UP BOX
FHS	VEHICLE FUEL-GASOLINE E85
G94	AXLE-RR ELECTRONIC LOCKING DIFFERENTIAL, DRIVER SELECT
GF2	TRIM PACKAGE-CUSTOM
GF3	TRIM PACKAGE-LT
GF5	TRIM PACKAGE-WORK TRUCK
GF9	TRIM PACKAGE-LTZ
GFD	TRIM PACKAGE-HIGH COUNTRY
GRZ	TRIM PACKAGE-ZR2
HS1	ALERT-SAFETY HAPTIC SEAT

RPO	Option Name
IOK	RADIO-INFOTAINMENT SYSTEM - 3.X MID/HIGH HMI,ENHANCED CONNECTIVITY 2.0, VOICE RECOGNITION
IOR	RADIO-INFOTAINMENT SYSTEM - 3.X LOW HMI, MIDLEVEL CONNECTIVITY 3.X
JBP	BRAKE LINING WEAR SY-LIFE SPAN PROGNOSTIC INDICATOR
JHD	BRK APL CTRL FEATURE-HILL DESCENT, GEAR HOLD
JL1	BRK APL CTRL FEATURE-INTEGRATED TRAILER BRAKE
K34	CRUISE CONTROL-AUTOMATIC, ELECTRONIC
K4C	CHARGER-INDUCTIVE PORTABLE WIRELESS DEVICE (DNU AFTER MY 26, SEE BFO)
K4Z	BATTERY-LN3, AGM, 12V, 70AH, 700 CCA, AUX
KA1	HEATER SEAT FRT-DRVR and PASS (DNU NEXT NEW MAJOR)
KA6	HEATER SEAT-REAR (DNU NEXT NEW MAJOR)
KC5	RECEPTACLE-ELECTRICAL, ACCESSORY (DNU NEW/MAJOR - USE KH8)
KC9	RECEPTACLE PUBX-ELECTRICAL, 110 VOLT
KCA	RECEPTACLE PUBX-ELECTRICAL, 230 VOLT
KGU	MODULE-UPFITTER, SERIAL DATA GATEWAY
KHF	GENERATOR-170 AMP AND 220 AMP, DUAL
KI3	STEERING WHEEL HEAT-AUTOMATIC
KI4	RECEPTACLE I/P-ELECTRICAL, 110 VOLT
KI5	RECEPTACLE I/P-ELECTRICAL, 230 VOLT
KQV	HEATER-SEAT, VENTED, FRT (DO NOT USE NEXT NEW MAJOR, USE KU9)
KSG	CRUISE CONTROL-AUTOMATIC, ADAPTIVE, WITH STOP/GO
KW7	GENERATOR-170 AMP
L5P	ENGINE-DIESEL, 8 CYL, 6.6L, DI, V8, TURBO, DURAMAX, GEN 5, VAR. 1
L8T	ENGINE-GAS, 8 CYL, 6.6L, SIDI, VVT, CAST IRON
MGM	TRANSMISSION-AUTO 10 SPD, 10L1000, GRX, GEN 1, VAR 1
MGU	TRANSMISSION-AUTO 10 SPD, 10L1000, GRX, GEN 2, VAR 2
MKM	TRANSMISSION-AUTO 10 SPD, RWD 4.54 1ST, 2.86 2ND, 2.06 3RD, 1.71 4TH, 1.48 5TH, 1.26 6TH, 1.00 7TH, 10L1001
N06	STEERING COLUMN LOCK-ELECTRICAL
N2N	FUEL TANK-DUAL TANK, FRONT TANK 23.5 GAL (89L) REAR TANK 40 GAL (151L)
NQF	TRANSFER CASE-ELECTRIC SHIFT CONT, TWO SPEED, ALUM
NQH	TRANSFER CASE-ACTIVE, TWO SPEED, SWITCH ACTIVATED, ALUM
NV8	STEERING-POWER, MAGNETIC SPEED, VARIABLE ASSIST
PTO	ENGINE CONTROL-POWER TAKE OFF (PTO) CONTROLS
QK1	GATE TYPE-PUBX END STANDARD
QK2	GATE TYPE-PUBX END ENHANCED
QT5	GATE FUNCTION-MANUAL ASSIST POWER RELEASE
QT6	GATE FUNCTION-POWER
T3U	LAMP FRT FOG-FRT FOG
T4A	HEADLAMPS-HALOGEN (DNU NEXT NEW MAJOR)
T4L	HEADLAMPS-LED (DNU NEXT NEW MAJOR)
U01	LAMP-FIVE, ROOF MARKER, TRUCK
U12	LAMP-EXTR, OSRV MIRROR, TASK

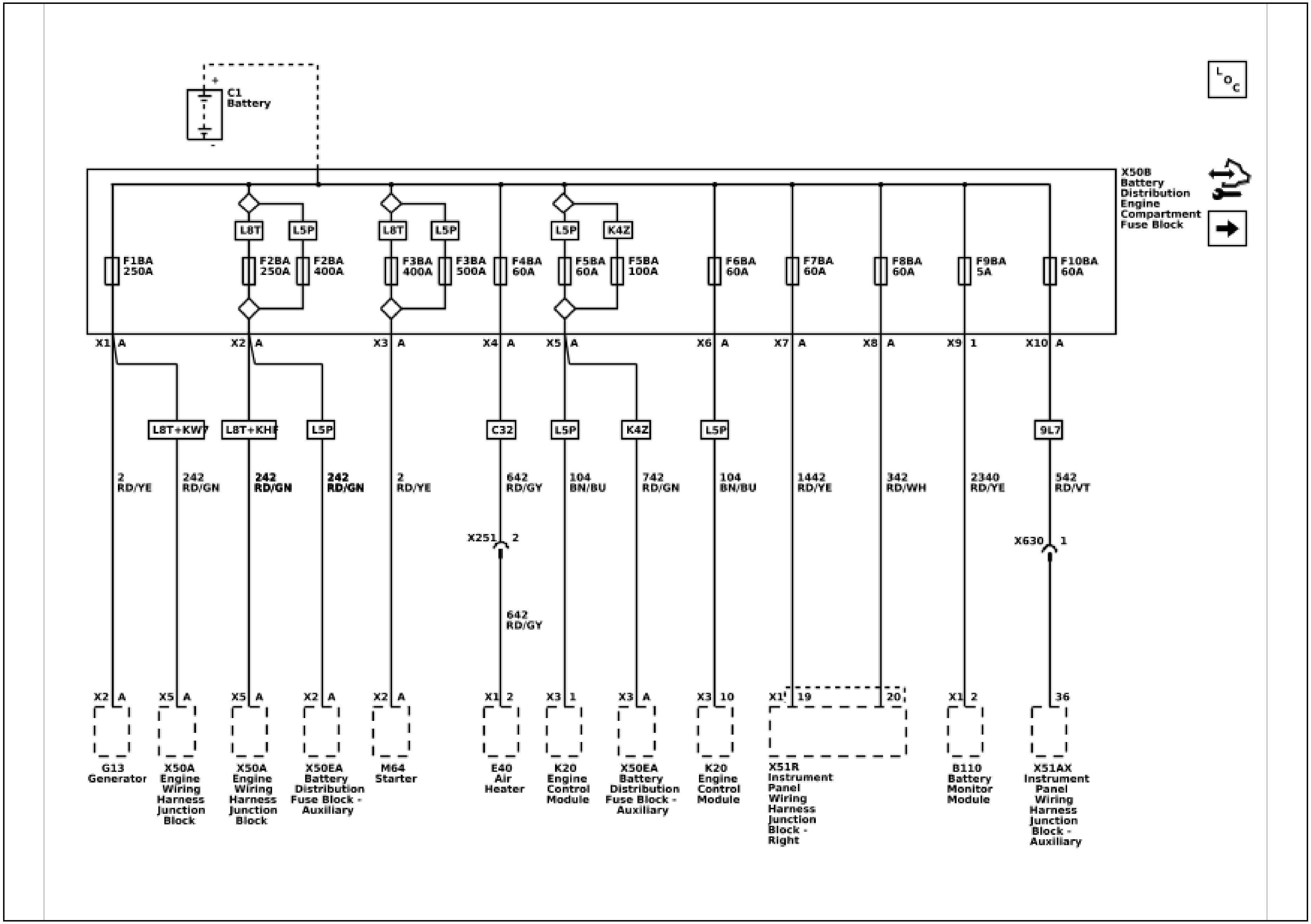
RPO	Option Name
U2K	DIGITAL AUDIO SYSTEM-S-BAND
U2Q	DIGITAL AUDIO SYSTEM-INTEGRATED TYPE DAB/DAB+/DMB-R
UBC	RECPT USB ARMREST-DUAL, CHARGE, DATA
UBI	RECPT USB FLR CNSL R-DUAL, CHARGE
UBJ	RECPT USB IP LWR-DUAL, CHARGE, DATA
UD5	PARK ASSIST-FRONT AND REAR
UDC	DISPLAY INSTRUMENT-DRIVER INFO ENHANCED (ONE COLOR GRAPHIC)
UDV	DISPLAY INSTRUMENT-DRIVER INFO ENHANCED, FULL CLUSTER (MULTI COLOR GRAPHIC)
UE1	COMMUNICATION SYSTEM-VEHICLE, ONSTAR
UET	INDICATOR-SMART TRAILER INTEGRATION
UEU	SENSOR INDICATOR-FORWARD COLLISION ALERT
UF2	LAMP-CARGO
UHY	COLL IMMINENT BRK-LOW SPEED, VEH FWD MOVEMENT, BRAKE PREFILL, INTEGRATED BRAKE ASSIST
UK3	CONTROL-STEERING WHEEL, ACCESSORY
UKC	SIDE ACTIVE SAFETY-OBSTACLE DETECTION ENHANCED
UKV	SIDE ACTIVE SAFETY-OBSTACLE DETECTION ENHANCED, EXTENDED TRAILER VIEW
UQA	SPEAKER SYSTEM-PREMIUM AUDIO, BRANDED AMPLIFIER
UQF	SPEAKER SYSTEM-STANDARD AUDIO
URC	SWITCH-FLEXRIDE MODE SYSTEM
UTJ	THEFT DETERENT-ELECTRICAL, UNAUTHORIZED ENTRY
UV2	VISION-360 VIEW, MONO, HD DIGITAL
UV6	HEAD UP DISPLAY-WINDSHIELD
UVN	VISION AUXILIARY-CARGO BED
UVO	VISION AUXILIARY-CARGO BED BASE
UY2	WIRING PROVISIONS-CAMPER and 5TH WHEEL TRAILER
VHU	BUMPER FRT-SPORT
VTI	SHUTTERS-FRONT GRILLE, ACTIVE, UPR
VV4	COMMUNICATION EQUIP-MOBILE INTERNET CONNECTIVITY
Z6A	PROVISIONS-SPECIAL EQUIPMENT, 5TH WHEEL/ GOOSENECK TRAILER HITCH PREP PACKAGE
Z82	TRAILER PROVISIONS-SPECIAL EQUIPMENT, H.D.
ZW9	BODY EQUIPMENT-BASE BODY OR CHASSIS

Master Electrical Schematic Icons

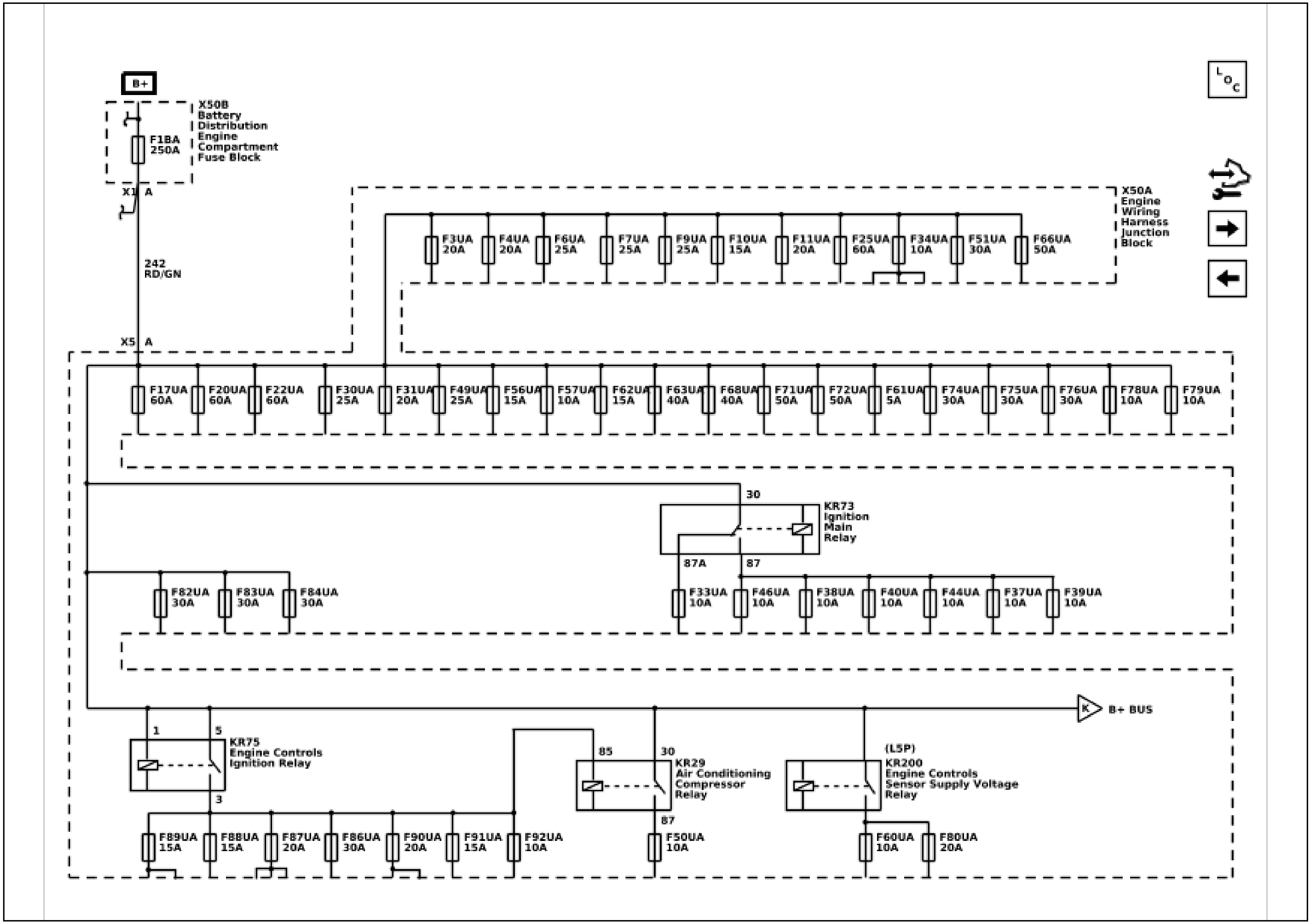
Master Electrical Schematic Icons

Icon	Icon Definition
 19386	***Warning: When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR Disabling and Enabling . Failure to observe the correct procedure could cause deployment of the SIR components, personal injury, or unnecessary SIR system repairs.***
 902886	**Note:** Twisted-pair wires provide an effective shield that helps protect sensitive electronic components from electrical interference. If the wires were covered with shielding, install new shielding.In order to prevent electrical interference from degrading the performance of the connected components, you must maintain the proper specification when making any repairs to the twisted-pair wires shown : • The wires must be twisted a minimum of 9 turns per 31 cm (12 in) as measured anywhere along the length of the wires. • The outside diameter of the twisted wires must not exceed 6.0 mm (0.25 in).

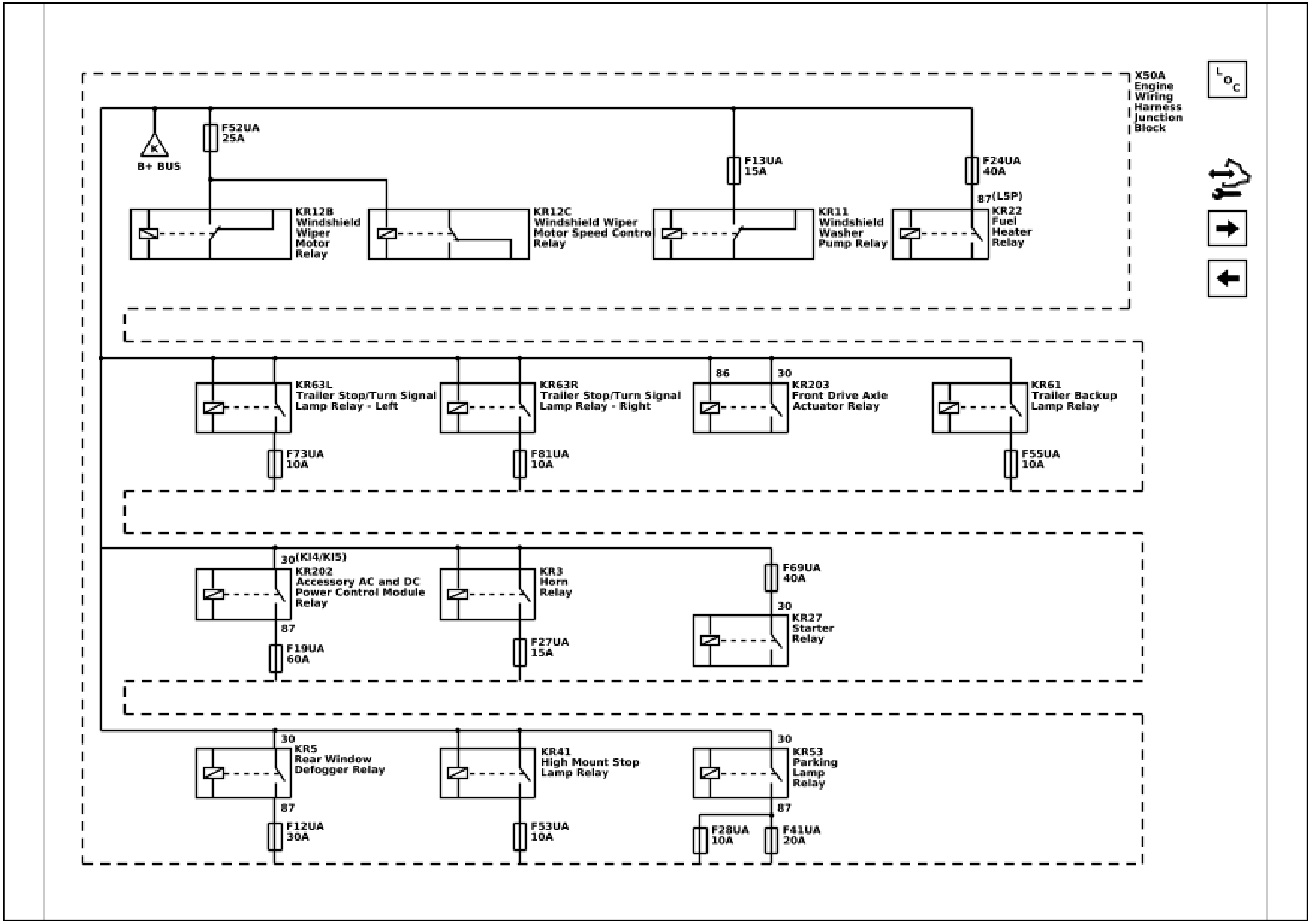
Power Distribution Schematics (Battery Distribution Engine Compartment Fuse Block)


C1 Battery
+
-
X50B Battery Distribution Engine Compartment Fuse Block
L8T
L5P
L8T
L5P
L5P
K4Z
F1BA 250A
F2BA 250A
F2BA 400A
F3BA 400A
F3BA 500A
F4BA 60A
F5BA 60A
F5BA 100A
F6BA 60A
F7BA 60A
F8BA 60A
F9BA 5A
F10BA 60A
X1 A
X2 A
X3 A
X4 A
X5 A
X6 A
X7 A
X8 A
X9 1
X10 A
L8T+KW7
L8T+KHF
L5P
C32
L5P
K4Z
L5P
9L7
2 RD/YE
242 RD/GN
242 RD/GN
242 RD/GN
2 RD/YE
642 RD/GY
104 BN/BU
742 RD/GN
104 BN/BU
1442 RD/YE
342 RD/WH
2340 RD/YE
542 RD/VT
X251 2
642 RD/GY
X630 1
X2 A
X5 A
X5 A
X2 A
X2 A
X1 2
X3 1
X3 A
X3 10
X1 19
20
X1 2
36
G13 Generator
X50A Engine Wiring Harness Junction Block
X50A Engine Wiring Harness Junction Block
X50EA Battery Distribution Fuse Block - Auxiliary
M64 Starter
E40 Air Heater
K20 Engine Control Module
X50EA Battery Distribution Fuse Block - Auxiliary
K20 Engine Control Module
X51R Instrument Panel Wiring Harness Junction Block - Right
B110 Battery Monitor Module
X51AX Instrument Panel Wiring Harness Junction Block - Auxiliary
LOC
6846335

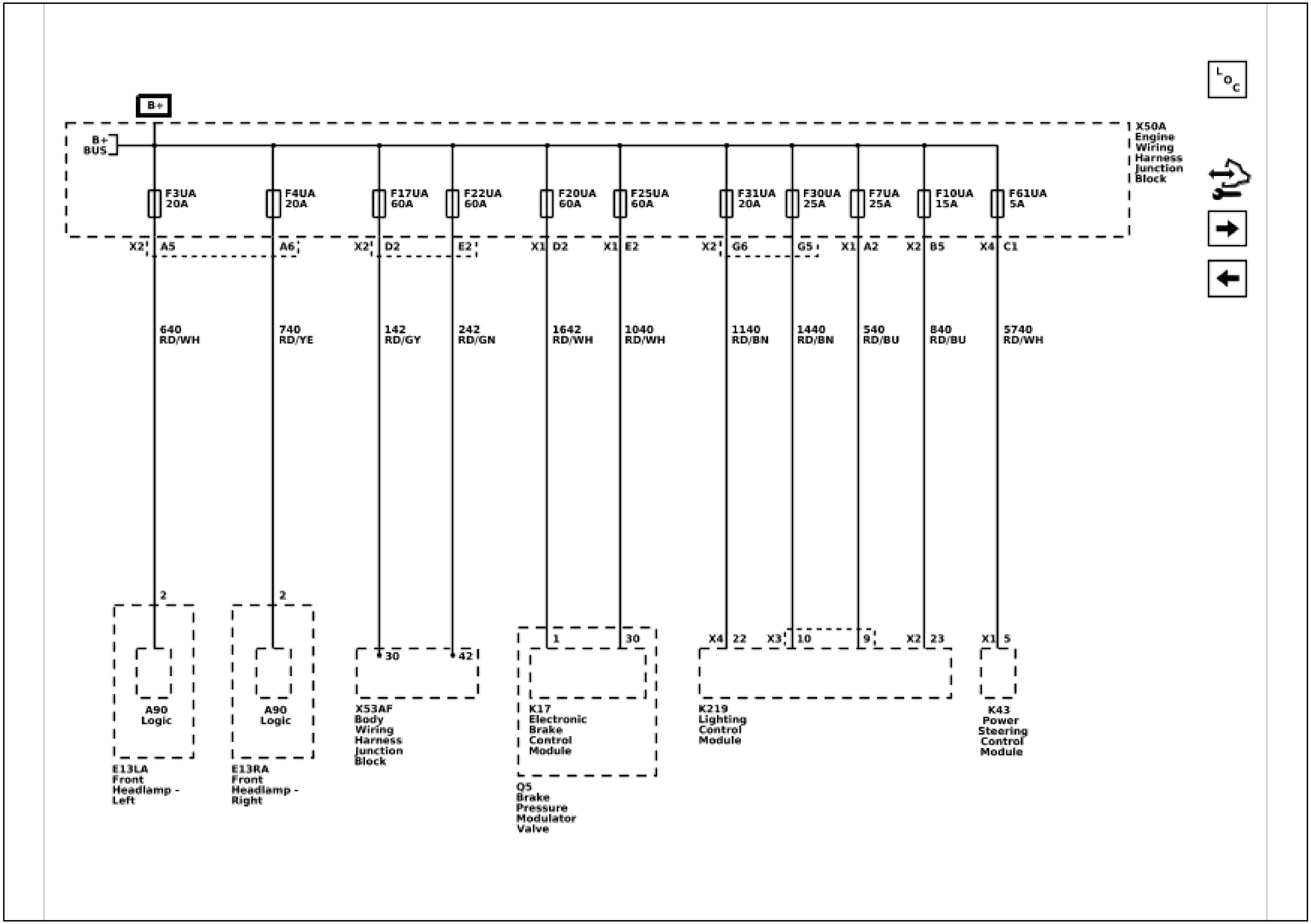
Power Distribution Schematics (Engine Wiring Harness Junction Block - B+ Bus - 1 of 2 (K4B))


B+
X50B
Battery
Distribution
Engine
Compartment
Fuse Block
F1BA
250A
X1 A
242
RD/GN
X5 A
X50A
Engine
Wiring
Harness
Junction
Block
F3UA 20A
F4UA 20A
F6UA 25A
F7UA 25A
F9UA 25A
F10UA 15A
F11UA 20A
F25UA 60A
F34UA 10A
F51UA 30A
F66UA 50A
F17UA 60A
F20UA 60A
F22UA 60A
F30UA 25A
F31UA 20A
F49UA 25A
F56UA 15A
F57UA 10A
F62UA 15A
F63UA 40A
F68UA 40A
F71UA 50A
F72UA 50A
F61UA 5A
F74UA 30A
F75UA 30A
F76UA 30A
F78UA 10A
F79UA 10A
30
KR73
Ignition
Main
Relay
87A
87
F82UA 30A
F83UA 30A
F84UA 30A
F33UA 10A
F46UA 10A
F38UA 10A
F40UA 10A
F44UA 10A
F37UA 10A
F39UA 10A
K
B+ BUS
1
5
KR75
Engine Controls
Ignition Relay
3
85
30
KR29
Air Conditioning
Compressor
Relay
87
(L5P)
KR200
Engine Controls
Sensor Supply Voltage
Relay
F89UA 15A
F88UA 15A
F87UA 20A
F86UA 30A
F90UA 20A
F91UA 15A
F92UA 10A
F50UA 10A
F60UA 10A
F80UA 20A
6846336

Power Distribution Schematics (Engine Wiring Harness Junction Block - B+ Bus - 2 of 2 (L5P))

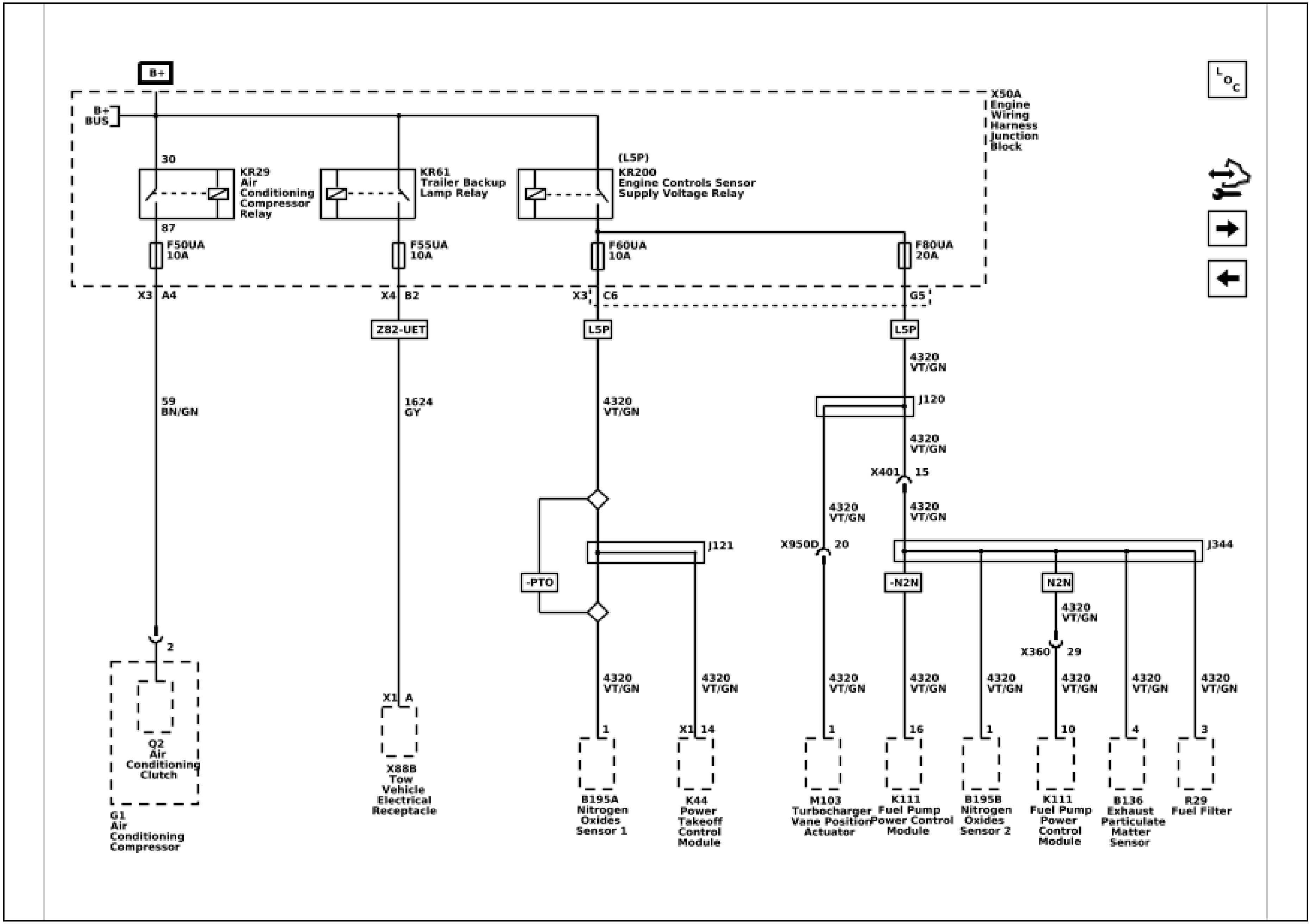

X50A Engine Wiring Harness Junction Block
B+ BUS
K
F52UA 25A
F13UA 15A
F24UA 40A
87(L5P)
KR12B Windshield Wiper Motor Relay
KR12C Windshield Wiper Motor Speed Control Relay
KR11 Windshield Washer Pump Relay
KR22 Fuel Heater Relay
KR63L Trailer Stop/Turn Signal Lamp Relay - Left
KR63R Trailer Stop/Turn Signal Lamp Relay - Right
86
30
KR203 Front Drive Axle Actuator Relay
KR61 Trailer Backup Lamp Relay
F73UA 10A
F81UA 10A
F55UA 10A
30(KI4/KI5)
KR202 Accessory AC and DC Power Control Module Relay
87
F19UA 60A
KR3 Horn Relay
F27UA 15A
F69UA 40A
30
KR27 Starter Relay
30
KR5 Rear Window Defogger Relay
87
F12UA 30A
KR41 High Mount Stop Lamp Relay
F53UA 10A
30
KR53 Parking Lamp Relay
87
F28UA 10A
F41UA 20A
6846337

Power Distribution Schematics (F3UA, F4UA, F7UA, F10UA, F17UA, F20UA, F22UA, F25UA, F30UA, F31UA, and F61UA Fuses)


B+
B+ BUS
X50A Engine Wiring Harness Junction Block
F3UA 20A
F4UA 20A
F17UA 60A
F22UA 60A
F20UA 60A
F25UA 60A
F31UA 20A
F30UA 25A
F7UA 25A
F10UA 15A
F61UA 5A
X2 A5
A6
X2 D2
E2
X1 D2
X1 E2
X2 G6
G5
X1 A2
X2 B5
X4 C1
640 RD/WH
740 RD/YE
142 RD/GY
242 RD/GN
1642 RD/WH
1040 RD/WH
1140 RD/BN
1440 RD/BN
540 RD/BU
840 RD/BU
5740 RD/WH
2
2
30
42
1
30
X4 22
X3 10
9
X2 23
X1 5
A90 Logic
E13LA Front Headlamp - Left
A90 Logic
E13RA Front Headlamp - Right
X53AF Body Wiring Harness Junction Block
K17 Electronic Brake Control Module
Q5 Brake Pressure Modulator Valve
K219 Lighting Control Module
K43 Power Steering Control Module
L O C

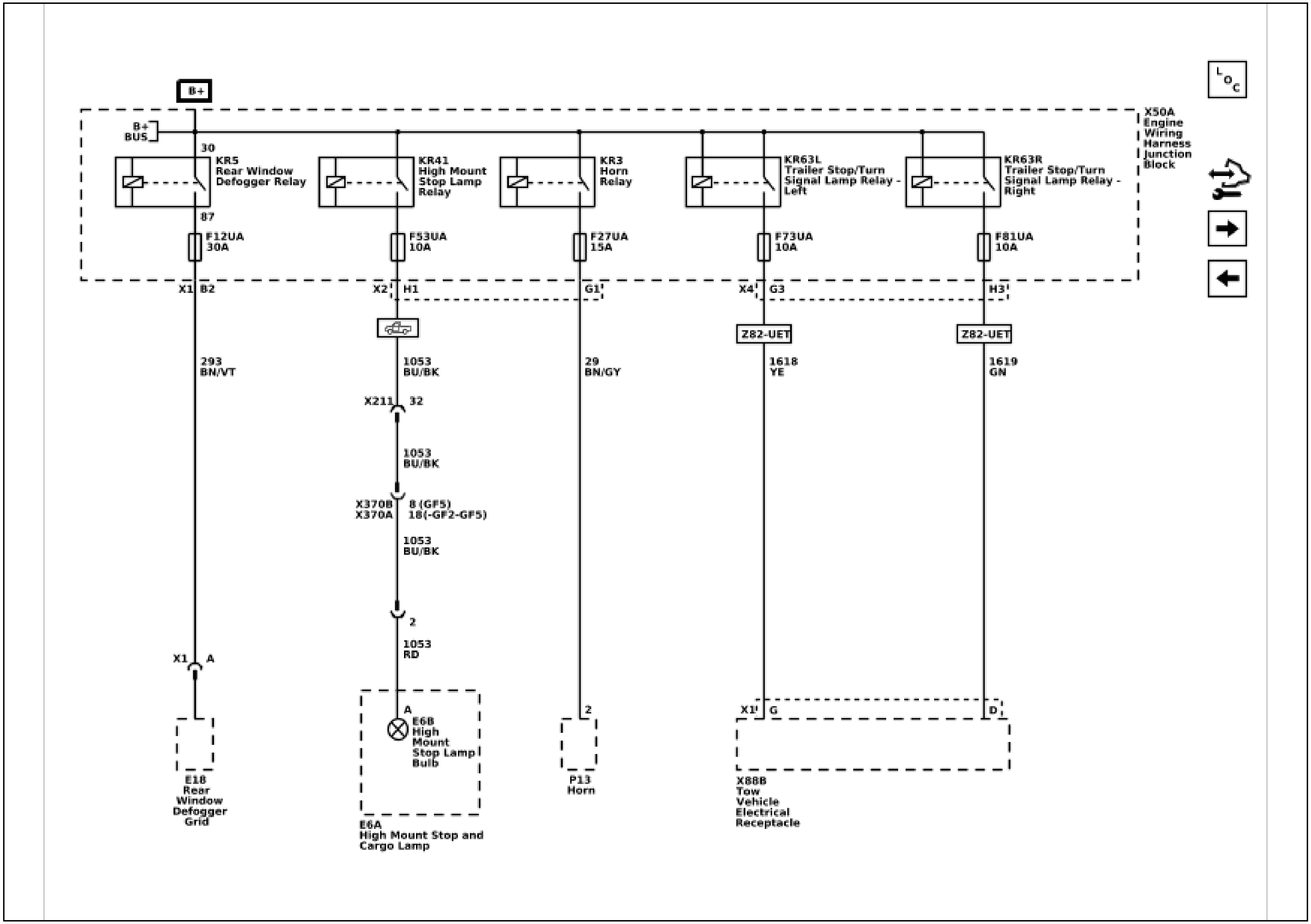
6846338

Power Distribution Schematics (F50UA, F55UA, F60UA, and F80UA Fuses)


B+
B+ BUS
X50A Engine Wiring Harness Junction Block
30
87
KR29 Air Conditioning Compressor Relay
KR61 Trailer Backup Lamp Relay
(L5P)
KR200 Engine Controls Sensor Supply Voltage Relay
F50UA 10A
F55UA 10A
F60UA 10A
F80UA 20A
X3 A4
X4 B2
X3 C6
G5
Z82-UET
L5P
L5P
59 BN/GN
1624 GY
4320 VT/GN
J120
J121
J344
X401 15
X950D 20
-PTO
-N2N
N2N
X360 29
2
X1 A
1
X1 14
1
16
1
10
4
3
Q2 Air Conditioning Clutch
G1 Air Conditioning Compressor
X88B Tow Vehicle Electrical Receptacle
B195A Nitrogen Oxides Sensor 1
K44 Power Takeoff Control Module
M103 Turbocharger Vane Position Actuator
K111 Fuel Pump Power Control Module
B195B Nitrogen Oxides Sensor 2
K111 Fuel Pump Power Control Module
B136 Exhaust Particulate Matter Sensor
R29 Fuel Filter

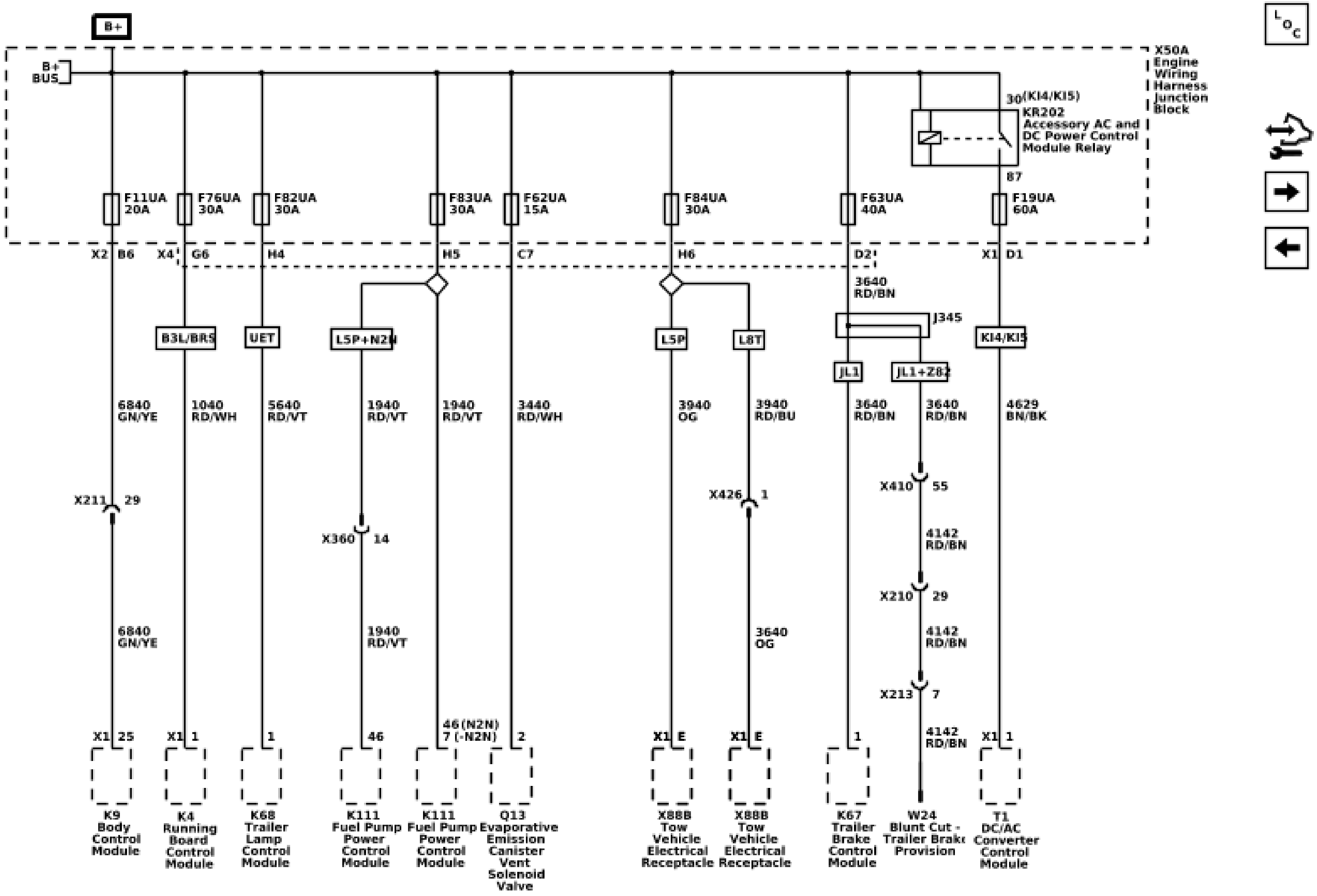
6846339

Power Distribution Schematics (F12UA, F27UA, F53UA, F73UA, and F81UA Fuses)


B+
B+ BUS
X50A Engine Wiring Harness Junction Block
30
KR5 Rear Window Defogger Relay
87
F12UA 30A
X1 B2
293 BN/VT
X1 A
E18 Rear Window Defogger Grid
KR41 High Mount Stop Lamp Relay
F53UA 10A
X2 H1
1053 BU/BK
X211 32
1053 BU/BK
X370B X370A 8 (GF5) 18(-GF2-GF5)
1053 BU/BK
2
1053 RD
A
E6B High Mount Stop Lamp Bulb
E6A High Mount Stop and Cargo Lamp
KR3 Horn Relay
F27UA 15A
G1
29 BN/GY
2
P13 Horn
KR63L Trailer Stop/Turn Signal Lamp Relay - Left
F73UA 10A
X4 G3
Z82-UET
1618 YE
X1 G
KR63R Trailer Stop/Turn Signal Lamp Relay - Right
F81UA 10A
H3
Z82-UET
1619 GN
D
X88B Tow Vehicle Electrical Receptacle
L O C

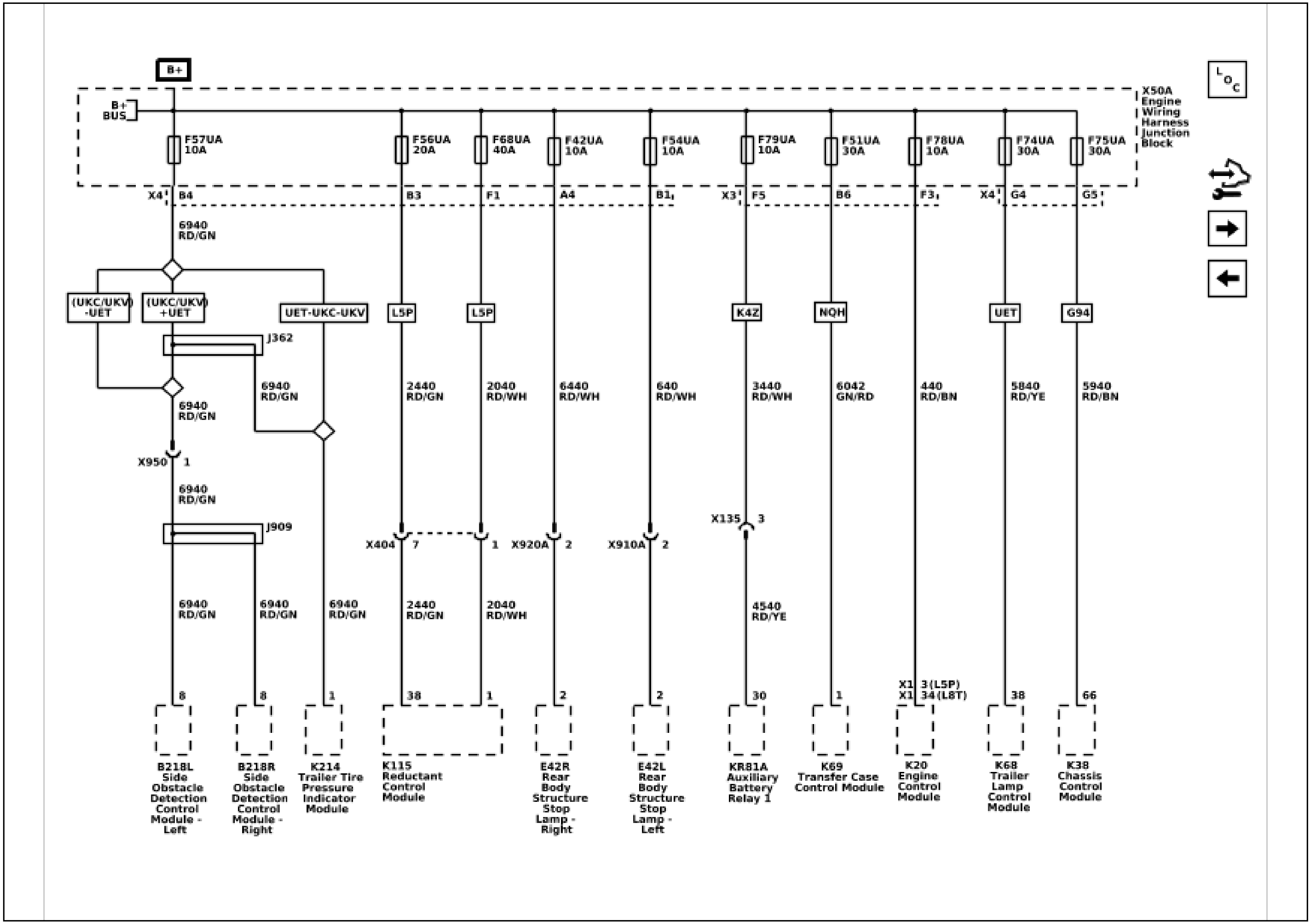
6846340

Power Distribution Schematics (F11UA, F19UA, F62UA, F63UA, F76UA, F82UA, F83UA, and F84UA Fuses)

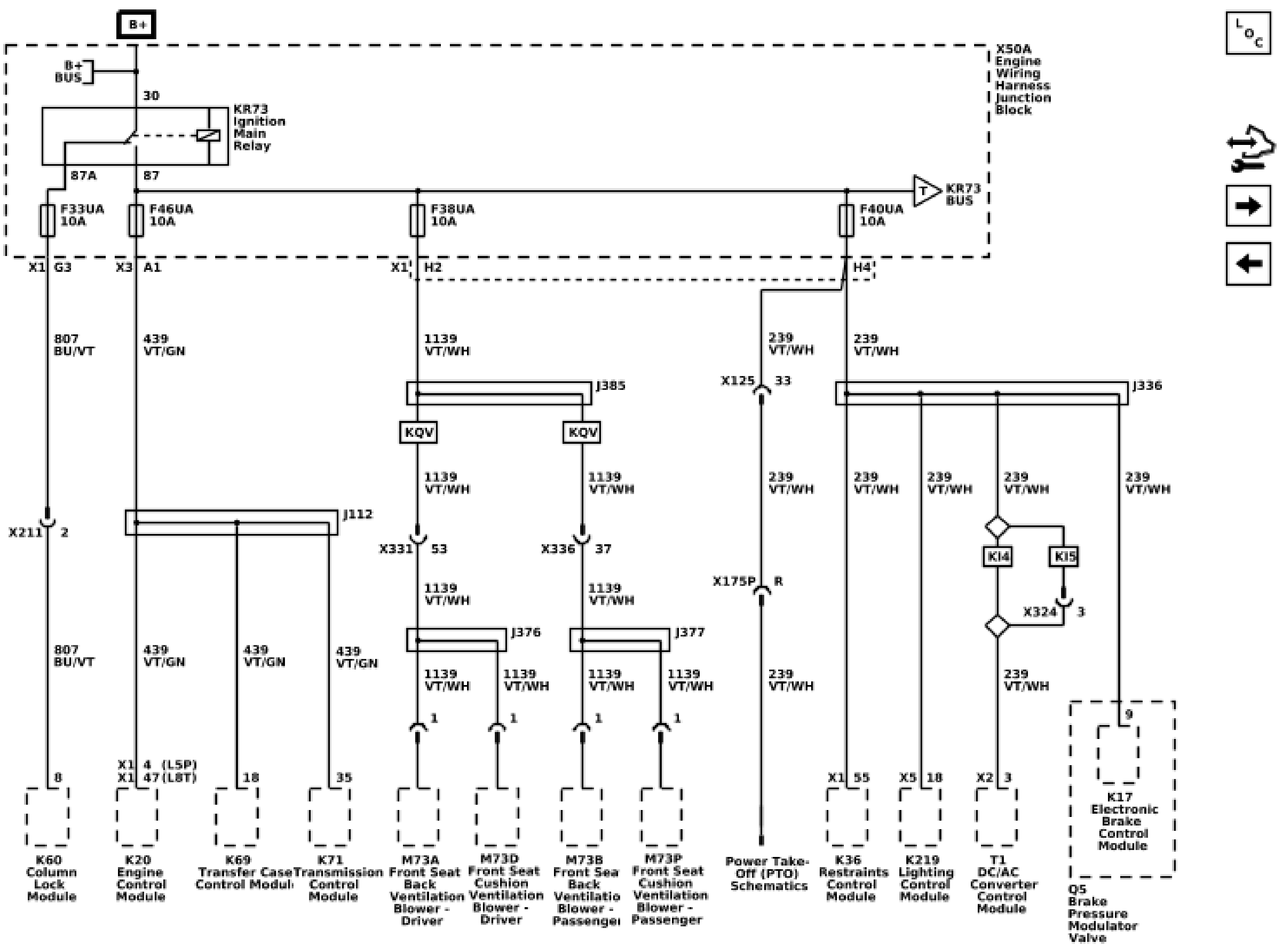

B+
B+ BUS
X50A Engine Wiring Harness Junction Block
30 (KI4/KI5)
KR202 Accessory AC and DC Power Control Module Relay
87
F11UA 20A
F76UA 30A
F82UA 30A
F83UA 30A
F62UA 15A
F84UA 30A
F63UA 40A
F19UA 60A
X2 B6
X4 G6
H4
H5
C7
H6
D2
X1 D1
3640 RD/BN
J345
B3L/BRS
UET
L5P+N2N
L5P
L8T
JL1
JL1+Z82
KI4/KI5
6840 GN/YE
1040 RD/WH
5640 RD/VT
1940 RD/VT
1940 RD/VT
3440 RD/WH
3940 OG
3940 RD/BU
3640 RD/BN
3640 RD/BN
4629 BN/BK
X410 55
4142 RD/BN
X211 29
X426 1
X360 14
X210 29
6840 GN/YE
1940 RD/VT
3640 OG
4142 RD/BN
X213 7
4142 RD/BN
X1 25
X1 1
1
46
46 (N2N)
7 (-N2N)
2
X1 E
X1 E
1
X1 1
K9 Body Control Module
K4 Running Board Control Module
K68 Trailer Lamp Control Module
K111 Fuel Pump Power Control Module
K111 Fuel Pump Power Control Module
Q13 Evaporative Emission Canister Vent Solenoid Valve
X88B Tow Vehicle Electrical Receptacle
X88B Tow Vehicle Electrical Receptacle
K67 Trailer Brake Control Module
W24 Blunt Cut - Trailer Brake Provision
T1 DC/AC Converter Control Module
L O C

6846341

Power Distribution Schematics (F42UA, F51UA, F54UA, F56UA, F57UA, F68UA, F74UA, F75UA, F78UA, and F79UA Fuses)

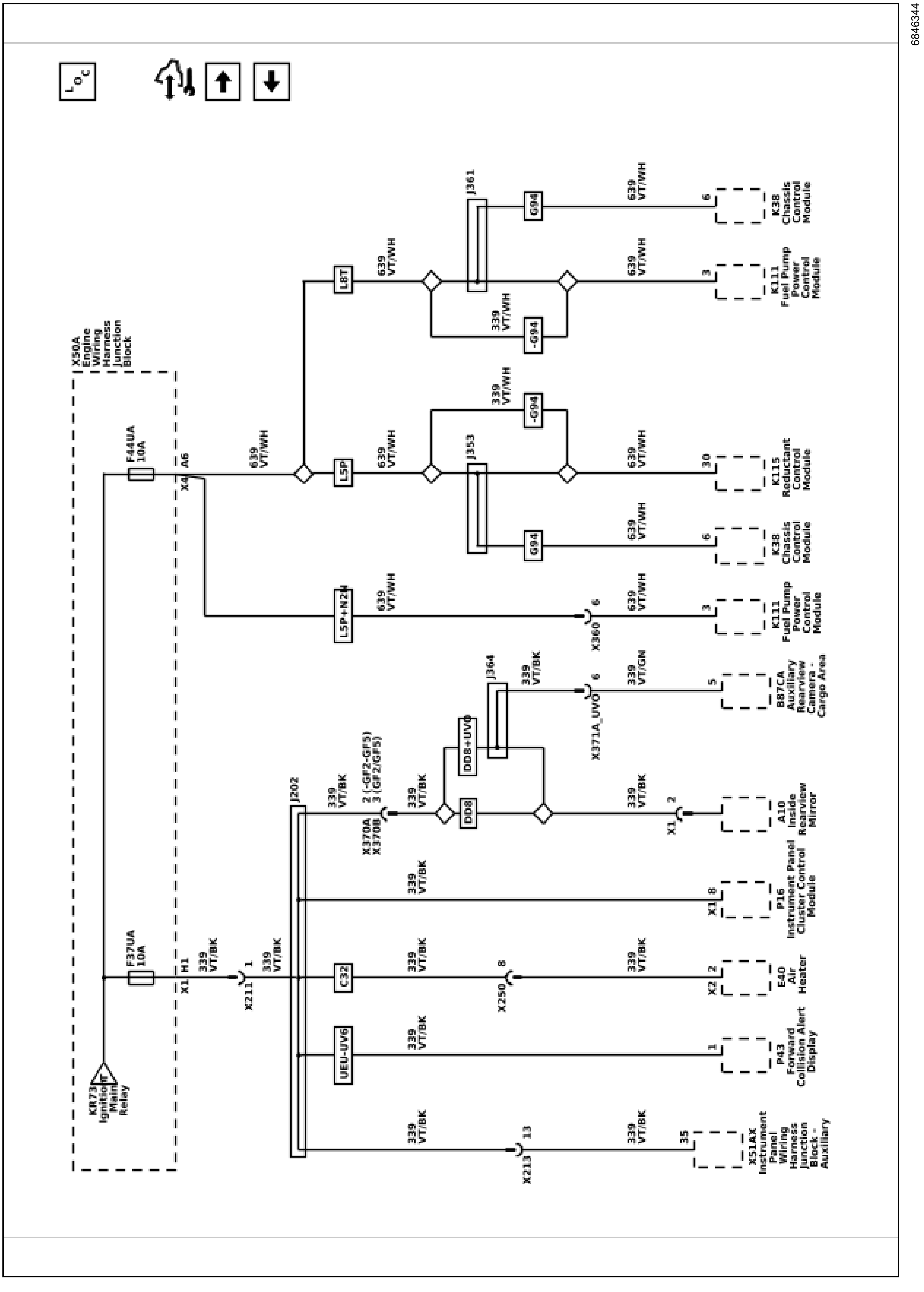

B+
B+ BUS
X50A Engine Wiring Harness Junction Block
F57UA 10A
F56UA 20A
F68UA 40A
F42UA 10A
F54UA 10A
F79UA 10A
F51UA 30A
F78UA 10A
F74UA 30A
F75UA 30A
X4 B4
B3
F1
A4
B1
X3 F5
B6
F3
X4 G4
G5
6940 RD/GN
(UKC/UKV) -UET
(UKC/UKV) +UET
UET-UKC-UKV
L5P
L5P
K4Z
NQH
UET
G94
J362
6940 RD/GN
6940 RD/GN
2440 RD/GN
2040 RD/WH
6440 RD/WH
640 RD/WH
3440 RD/WH
6042 GN/RD
440 RD/BN
5840 RD/YE
5940 RD/BN
X950 1
6940 RD/GN
J909
X135 3
X404 7
1
X920A 2
X910A 2
6940 RD/GN
6940 RD/GN
6940 RD/GN
2440 RD/GN
2040 RD/WH
4540 RD/YE
8
8
1
38
1
2
2
30
1
X1 3(L5P)
X1 34(L8T)
38
66
B218L Side Obstacle Detection Control Module - Left
B218R Side Obstacle Detection Control Module - Right
K214 Trailer Tire Pressure Indicator Module
K115 Reductant Control Module
E42R Rear Body Structure Stop Lamp - Right
E42L Rear Body Structure Stop Lamp - Left
KR81A Auxiliary Battery Relay 1
K69 Transfer Case Control Module
K20 Engine Control Module
K68 Trailer Lamp Control Module
K38 Chassis Control Module
L O C
6846342

Power Distribution Schematics (F33UA, F38UA, F40UA, and F46UA Fuses)

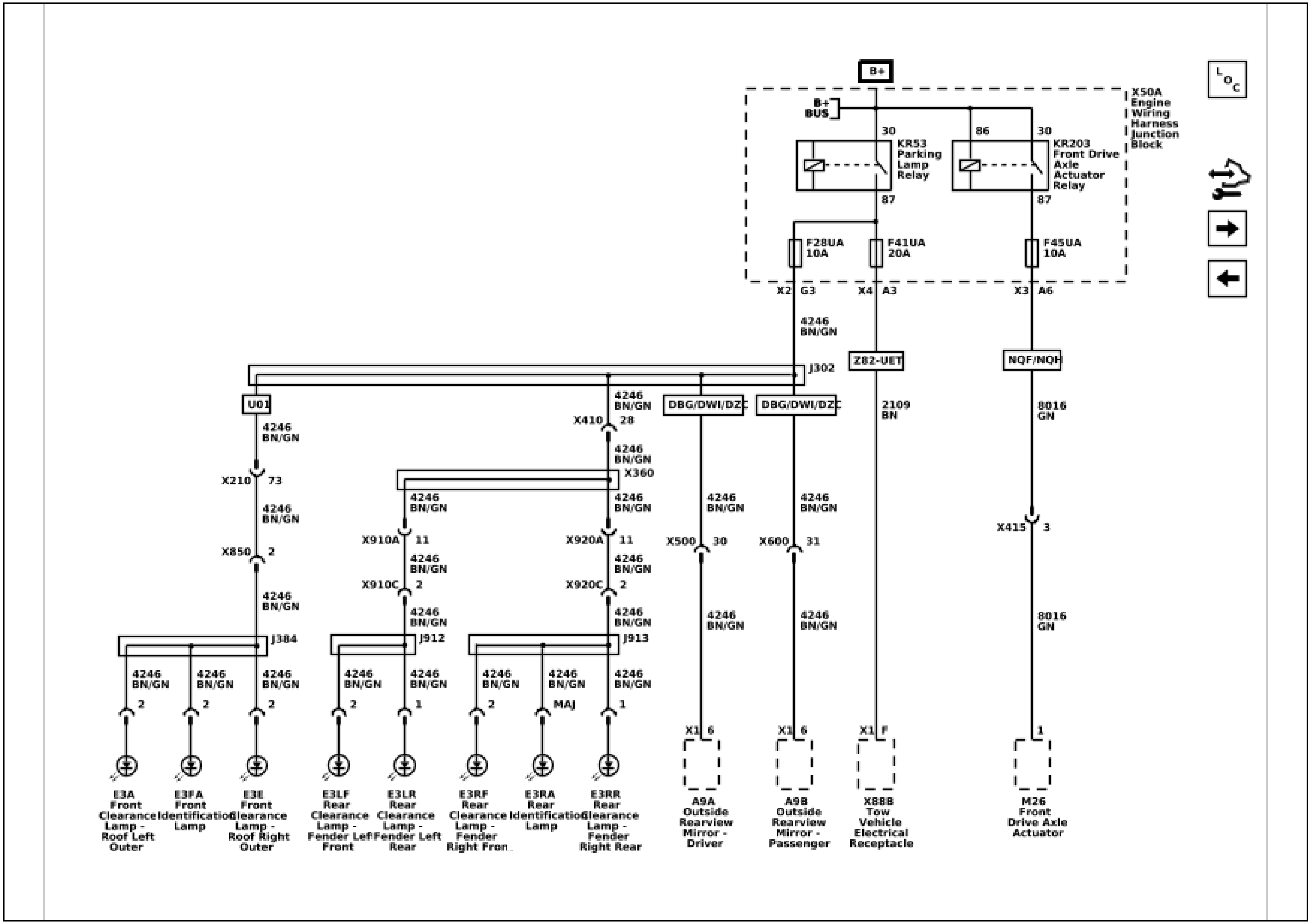

B+
B+ BUS
30
KR73 Ignition Main Relay
87A
87
X50A Engine Wiring Harness Junction Block
KR73 BUS
F33UA 10A
F46UA 10A
F38UA 10A
F40UA 10A
X1 G3
X3 A1
X1 H2
H4
807 BU/VT
439 VT/GN
1139 VT/WH
239 VT/WH
J385
J336
J112
X125 33
KQV
KQV
X211 2
X331 53
X336 37
X175P R
KI4
KI5
X324 3
J376
J377
1
9
8
X1 4 (L5P)
X1 47 (L8T)
18
35
X1 55
X5 18
X2 3
K60 Column Lock Module
K20 Engine Control Module
K69 Transfer Case Control Module
K71 Transmission Control Module
M73A Front Seat Back Ventilation Blower - Driver
M73D Front Seat Cushion Ventilation Blower - Driver
M73B Front Seat Back Ventilation Blower - Passenger
M73P Front Seat Cushion Ventilation Blower - Passenger
Power Take-Off (PTO) Schematics
K36 Restraints Control Module
K219 Lighting Control Module
T1 DC/AC Converter Control Module
K17 Electronic Brake Control Module
Q5 Brake Pressure Modulator Valve

6846343

Power Distribution Schematics (F37UA and F44UA Fuses)

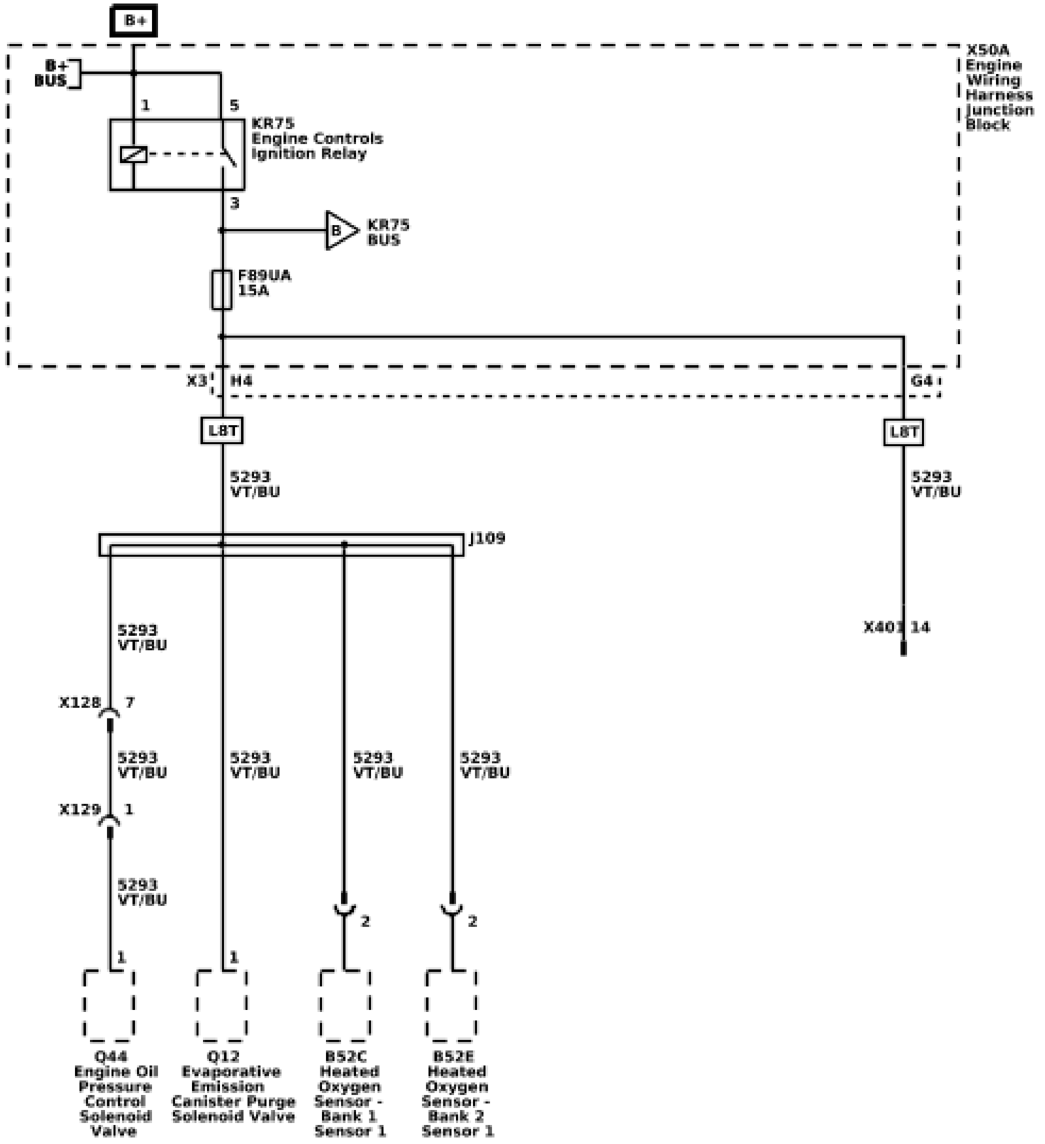

6846344
KR73 Ignition Main Relay
X50A Engine Wiring Harness Junction Block
F37UA 10A
F44UA 10A
X1 H1
X4 A6
339 VT/BK
639 VT/WH
339 VT/WH
339 VT/GN
X211 1
X250 8
X213 13
X370A 2 (-GF2-GF5)
X370B 3 (GF2/GF5)
X371A_UVO 6
X360 6
X1 2
X1 8
X2 2
J202
J364
J353
J361
UEU-UV6
C32
DD8
DD8+UVO
L5P+N2H
L5P
L8T
G94
-G94
35
X51AX Instrument Panel Wiring Harness Junction Block - Auxiliary
1
P43 Forward Collision Alert Display
E40 Air Heater
P16 Instrument Panel Cluster Control Module
A10 Inside Rearview Mirror
5
B87CA Auxiliary Rearview Camera - Cargo Area
3
K111 Fuel Pump Power Control Module
6
K38 Chassis Control Module
30
K115 Reductant Control Module

Power Distribution Schematics (F28UA, F41UA, and F45UA Fuses)


B+
B+ BUS
X50A Engine Wiring Harness Junction Block
30
86
KR53 Parking Lamp Relay
KR203 Front Drive Axle Actuator Relay
87
F28UA 10A
F41UA 20A
F45UA 10A
X2 G3
X4 A3
X3 A6
4246 BN/GN
Z82-UET
NQF/NQH
J302
U01
DBG/DWI/DZC
2109 BN
8016 GN
X410 28
X360
X210 73
X415 3
X910A 11
X920A 11
X500 30
X600 31
X850 2
X910C 2
X920C 2
J384
J912
J913
1
2
MAJ
X1 6
X1 F
E3A Front Clearance Lamp - Roof Left Outer
E3FA Front Identification Lamp
E3E Front Clearance Lamp - Roof Right Outer
E3LF Rear Clearance Lamp - Fender Left Front
E3LR Rear Clearance Lamp - Fender Left Rear
E3RF Rear Clearance Lamp - Fender Right Front
E3RA Rear Identification Lamp
E3RR Rear Clearance Lamp - Fender Right Rear
A9A Outside Rearview Mirror - Driver
A9B Outside Rearview Mirror - Passenger
X88B Tow Vehicle Electrical Receptacle
M26 Front Drive Axle Actuator

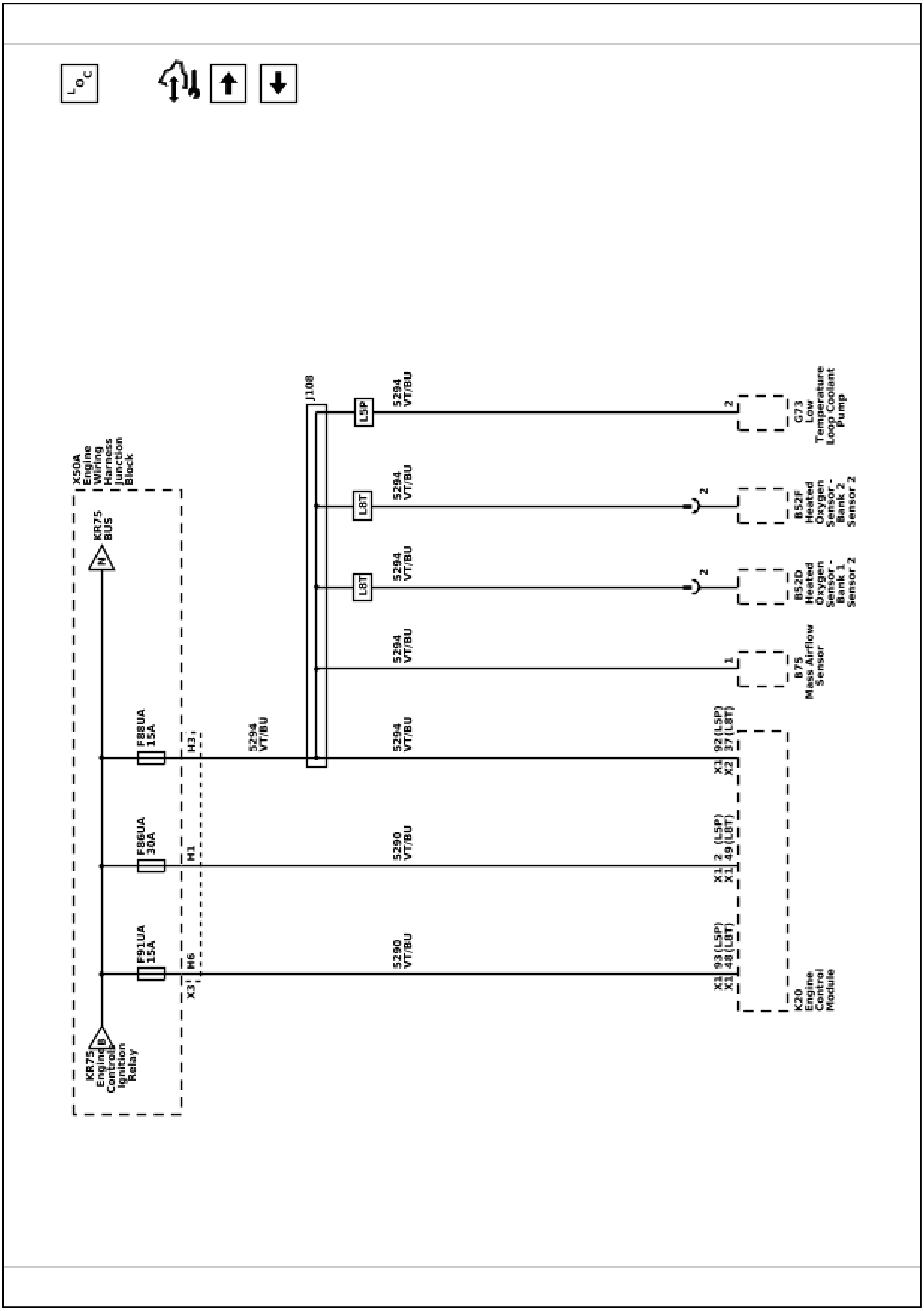
6846345

Power Distribution Schematics (F89UA Fuse)

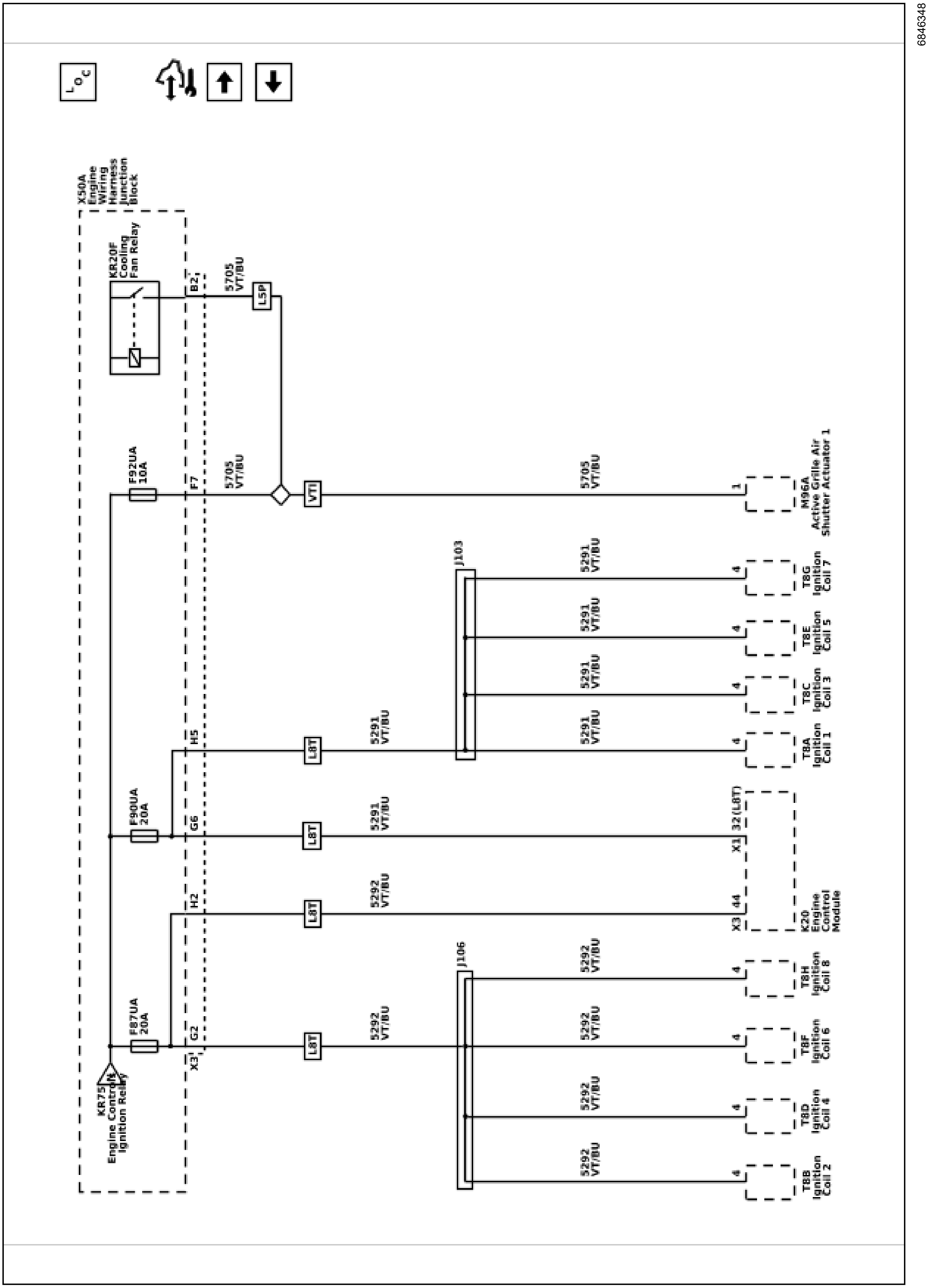

B+
B+ BUS
1
5
KR75 Engine Controls Ignition Relay
3
B
KR75 BUS
F89UA 15A
X50A Engine Wiring Harness Junction Block
X3
H4
G4
L8T
5293 VT/BU
L8T
5293 VT/BU
J109
X401 14
5293 VT/BU
X128 7
5293 VT/BU
X129 1
5293 VT/BU
5293 VT/BU
5293 VT/BU
5293 VT/BU
1
1
2
2
Q44 Engine Oil Pressure Control Solenoid Valve
Q12 Evaporative Emission Canister Purge Solenoid Valve
B52C Heated Oxygen Sensor - Bank 1 Sensor 1
B52E Heated Oxygen Sensor - Bank 2 Sensor 1

6846346

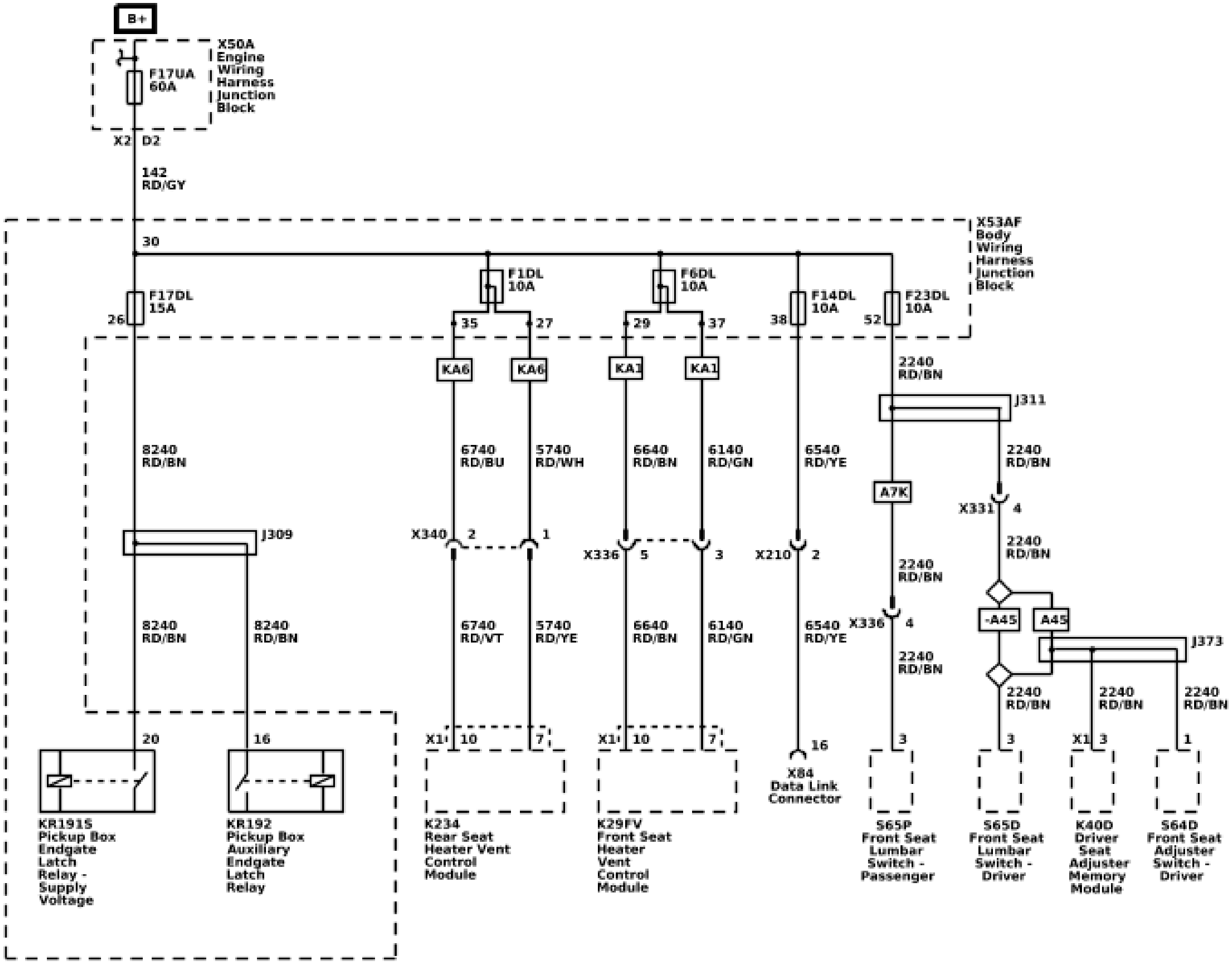
Power Distribution Schematics (F86UA and F88UA Fuses)


6846347
X50A Engine Wiring Harness Junction Block
KR75 BUS
N
B
KR75 Engine Control Ignition Relay
F91UA 15A
F86UA 30A
F88UA 15A
X3
H6
H1
H3
5290 VT/BU
5290 VT/BU
5294 VT/BU
5294 VT/BU
J108
L5P
L8T
L8T
5294 VT/BU
5294 VT/BU
5294 VT/BU
5294 VT/BU
X1 93(L5P)
X1 48(L8T)
X1 2 (L5P)
X1 49(L8T)
X1 92(L5P)
X2 37(L8T)
K20 Engine Control Module
1
B75 Mass Airflow Sensor
2
B52D Heated Oxygen Sensor - Bank 1 Sensor 2
2
B52F Heated Oxygen Sensor - Bank 2 Sensor 2
2
G73 Low Temperature Loop Coolant Pump

Power Distribution Schematics (F87UA, F90UA, and F92UA Fuses)

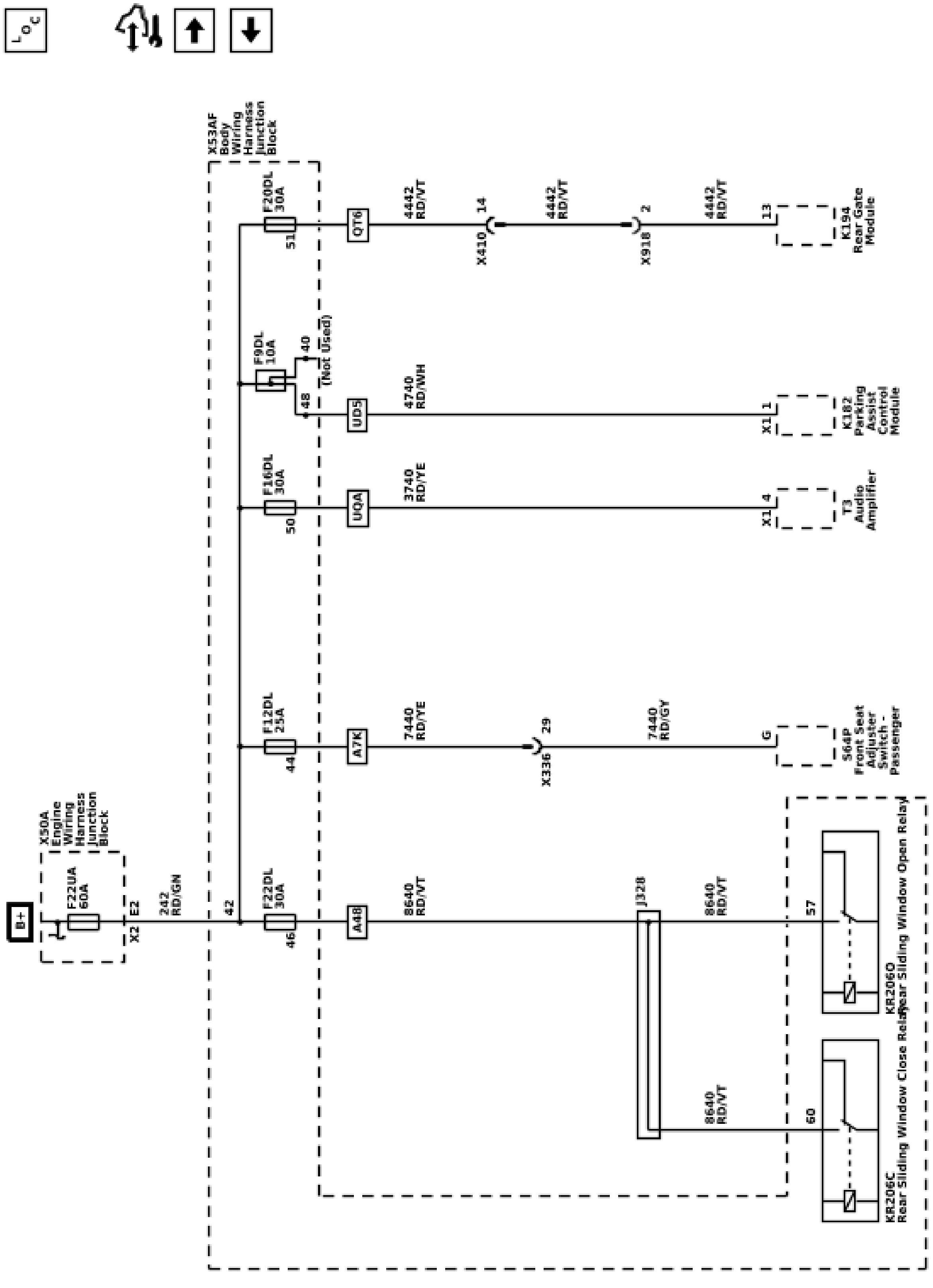

6846348
X50A Engine Wiring Harness Junction Block
KR20F Cooling Fan Relay
B2
5705 VT/BU
L5P
F92UA 10A
F7
5705 VT/BU
VTI
5705 VT/BU
1
M96A Active Grille Air Shutter Actuator 1
J103
5291 VT/BU
4
T8G Ignition Coil 7
5291 VT/BU
4
T8E Ignition Coil 5
5291 VT/BU
4
T8C Ignition Coil 3
H5
L8T
5291 VT/BU
5291 VT/BU
4
T8A Ignition Coil 1
F90UA 20A
G6
L8T
5291 VT/BU
32 (L8T)
X1
H2
L8T
5292 VT/BU
44
X3
K20 Engine Control Module
J106
5292 VT/BU
4
T8H Ignition Coil 8
F87UA 20A
G2
X3
L8T
5292 VT/BU
5292 VT/BU
4
T8F Ignition Coil 6
5292 VT/BU
4
T8D Ignition Coil 4
5292 VT/BU
4
T8B Ignition Coil 2
KR75 Engine Control Ignition Relay

Power Distribution Schematics (F1DL, F6DL, F14DL, F17DL, and F23DL Fuses)

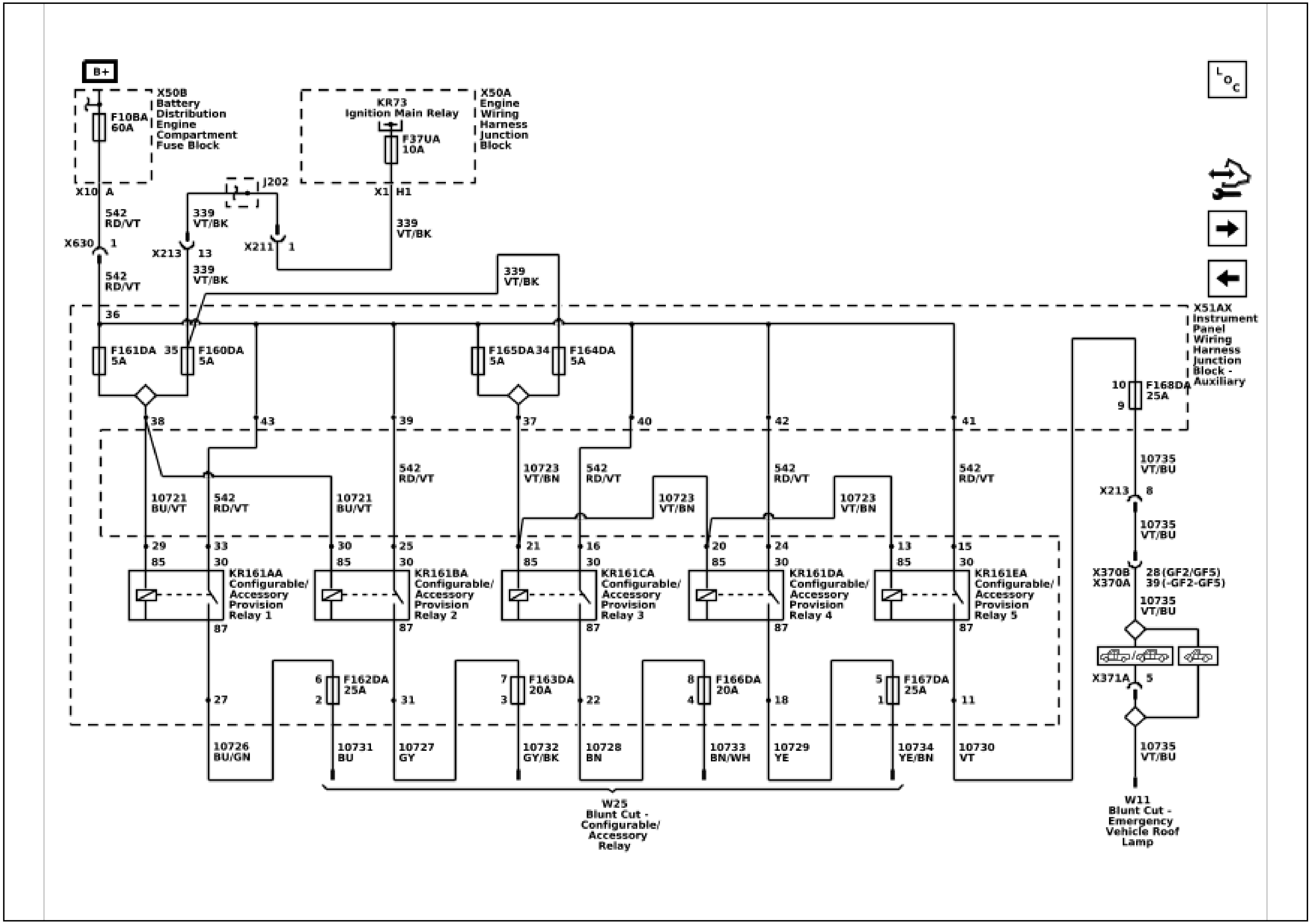

B+
X50A Engine Wiring Harness Junction Block
F17UA 60A
X2 D2
142 RD/GY
30
X53AF Body Wiring Harness Junction Block
F17DL 15A
26
F1DL 10A
35
27
F6DL 10A
29
37
F14DL 10A
38
F23DL 10A
52
KA6
KA6
KA1
KA1
8240 RD/BN
6740 RD/BU
5740 RD/WH
6640 RD/BN
6140 RD/GN
6540 RD/YE
2240 RD/BN
J311
2240 RD/BN
A7K
X331 4
2240 RD/BN
J309
X340 2
1
X336 5
3
X210 2
2240 RD/BN
X336 4
-A45
A45
J373
8240 RD/BN
8240 RD/BN
6740 RD/VT
5740 RD/YE
6640 RD/BN
6140 RD/GN
6540 RD/YE
2240 RD/BN
2240 RD/BN
2240 RD/BN
2240 RD/BN
20
16
X1 10
7
X1 10
7
16
3
3
X1 3
1
KR191S Pickup Box Endgate Latch Relay - Supply Voltage
KR192 Pickup Box Auxiliary Endgate Latch Relay
K234 Rear Seat Heater Vent Control Module
K29FV Front Seat Heater Vent Control Module
X84 Data Link Connector
S65P Front Seat Lumbar Switch - Passenger
S65D Front Seat Lumbar Switch - Driver
K40D Driver Seat Adjuster Memory Module
S64D Front Seat Adjuster Switch - Driver

6846349

Power Distribution Schematics (F9DL, F12DL, F16DL, F20DL, and F22DL Fuses (L5P))

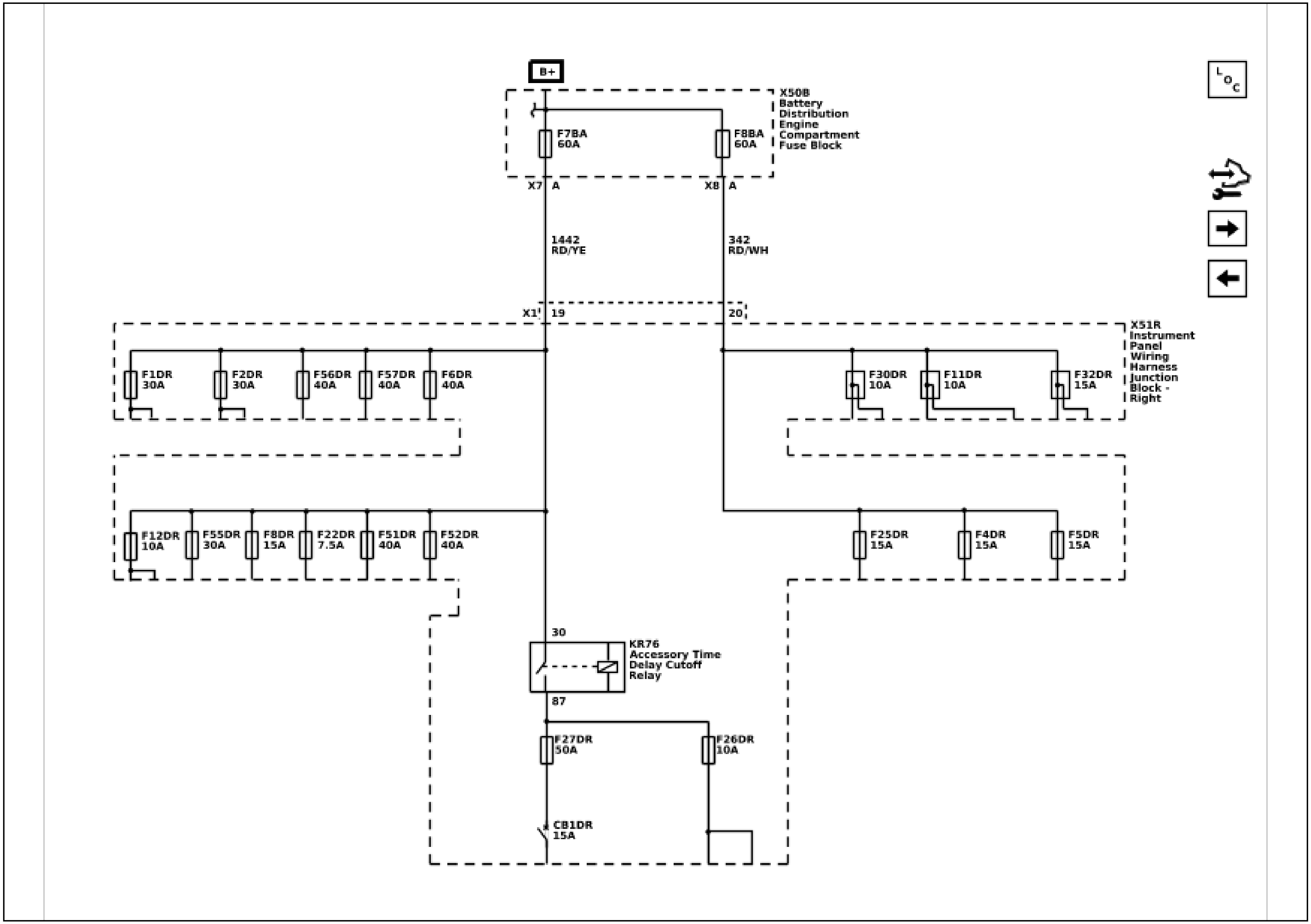

6846350
LOC
X53AF Body Wiring Harness Junction Block
F20DL 30A
51
QT6
4442 RD/VT
14
X410
4442 RD/VT
2
X918
4442 RD/VT
13
K194 Rear Gate Module
F9DL 10A
40
(Not Used)
48
UD5
4740 RD/WH
X1 1
K182 Parking Assist Control Module
F16DL 30A
50
UQA
3740 RD/YE
X1 4
T3 Audio Amplifier
F12DL 25A
44
A7K
7440 RD/YE
29
X336
7440 RD/GY
G
S64P Front Seat Adjuster Switch - Passenger
X50A Engine Wiring Harness Junction Block
B+
F22UA 60A
E2
X2
242 RD/GN
42
F22DL 30A
46
A48
8640 RD/VT
J328
8640 RD/VT
57
KR206O Rear Sliding Window Open Relay
8640 RD/VT
60
KR206C Rear Sliding Window Close Relay

Power Distribution Schematics (Instrument Panel Wiring Harness Junction Block - Auxiliary (L5P))


B+
X50B Battery Distribution Engine Compartment Fuse Block
F10BA 60A
X10 A
542 RD/VT
X630 1
542 RD/VT
KR73 Ignition Main Relay
X50A Engine Wiring Harness Junction Block
F37UA 10A
X1 H1
339 VT/BK
J202
339 VT/BK
X213 13
X211 1
339 VT/BK
339 VT/BK
36
F161DA 5A
35
F160DA 5A
F165DA 5A
34
F164DA 5A
38
43
39
37
40
42
41
10721 BU/VT
542 RD/VT
10721 BU/VT
542 RD/VT
10723 VT/BN
542 RD/VT
10723 VT/BN
542 RD/VT
10723 VT/BN
542 RD/VT
29
33
30
25
21
16
20
24
13
15
85
30
87
KR161AA Configurable/ Accessory Provision Relay 1
KR161BA Configurable/ Accessory Provision Relay 2
KR161CA Configurable/ Accessory Provision Relay 3
KR161DA Configurable/ Accessory Provision Relay 4
KR161EA Configurable/ Accessory Provision Relay 5
6 F162DA 25A 2
7 F163DA 20A 3
8 F166DA 20A 4
5 F167DA 25A 1
27
31
22
18
11
10726 BU/GN
10731 BU
10727 GY
10732 GY/BK
10728 BN
10733 BN/WH
10729 YE
10734 YE/BN
10730 VT
W25 Blunt Cut - Configurable/ Accessory Relay
X51AX Instrument Panel Wiring Harness Junction Block - Auxiliary
10 F168DA 25A 9
10735 VT/BU
X213 8
10735 VT/BU
X370B 28 (GF2/GF5)
X370A 39 (-GF2-GF5)
10735 VT/BU
X371A 5
10735 VT/BU
W11 Blunt Cut - Emergency Vehicle Roof Lamp
L O C

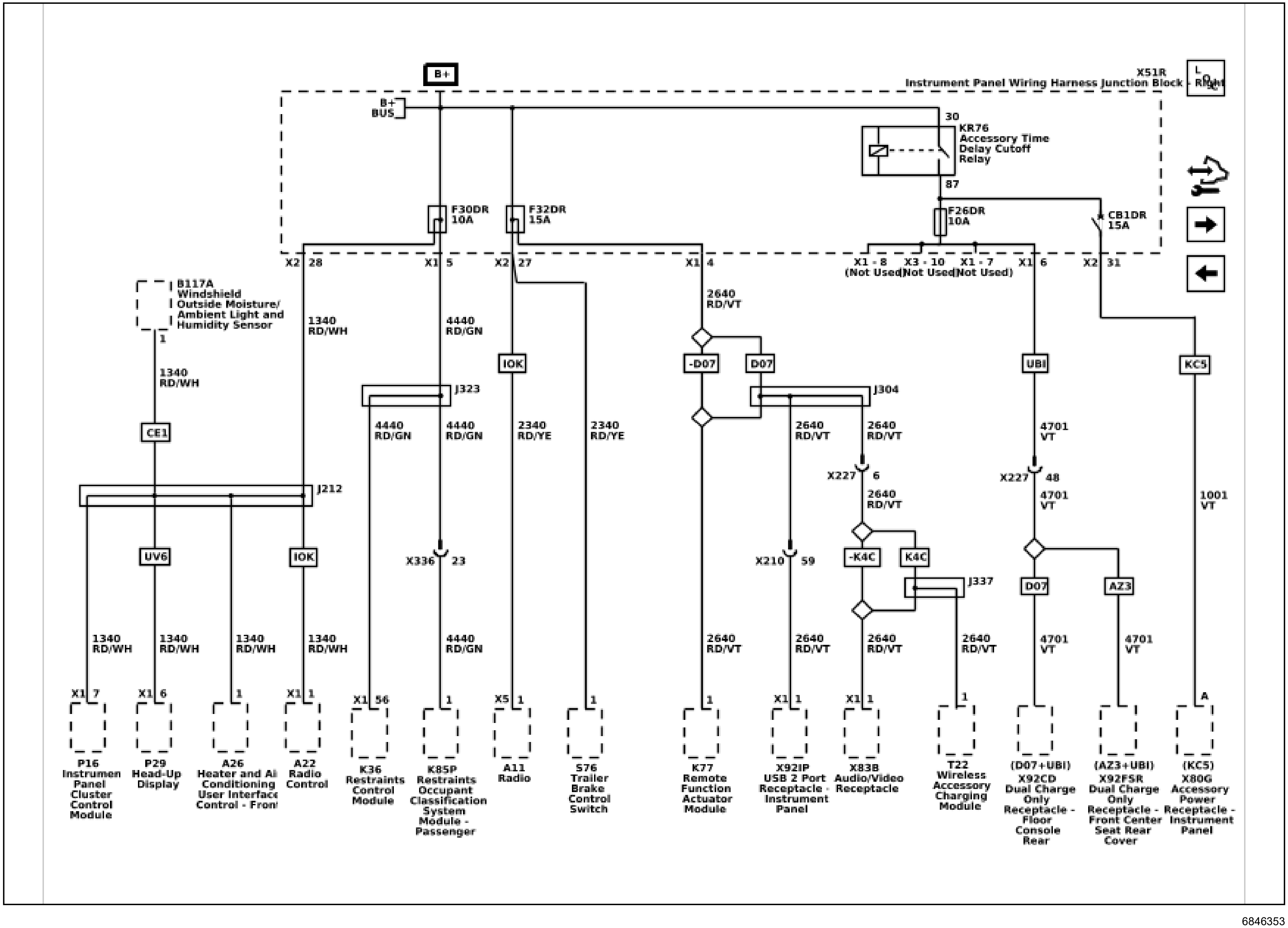
6846351

Power Distribution Schematics (Instrument Panel Wiring Harness Junction Block - Right - B+ Bus)

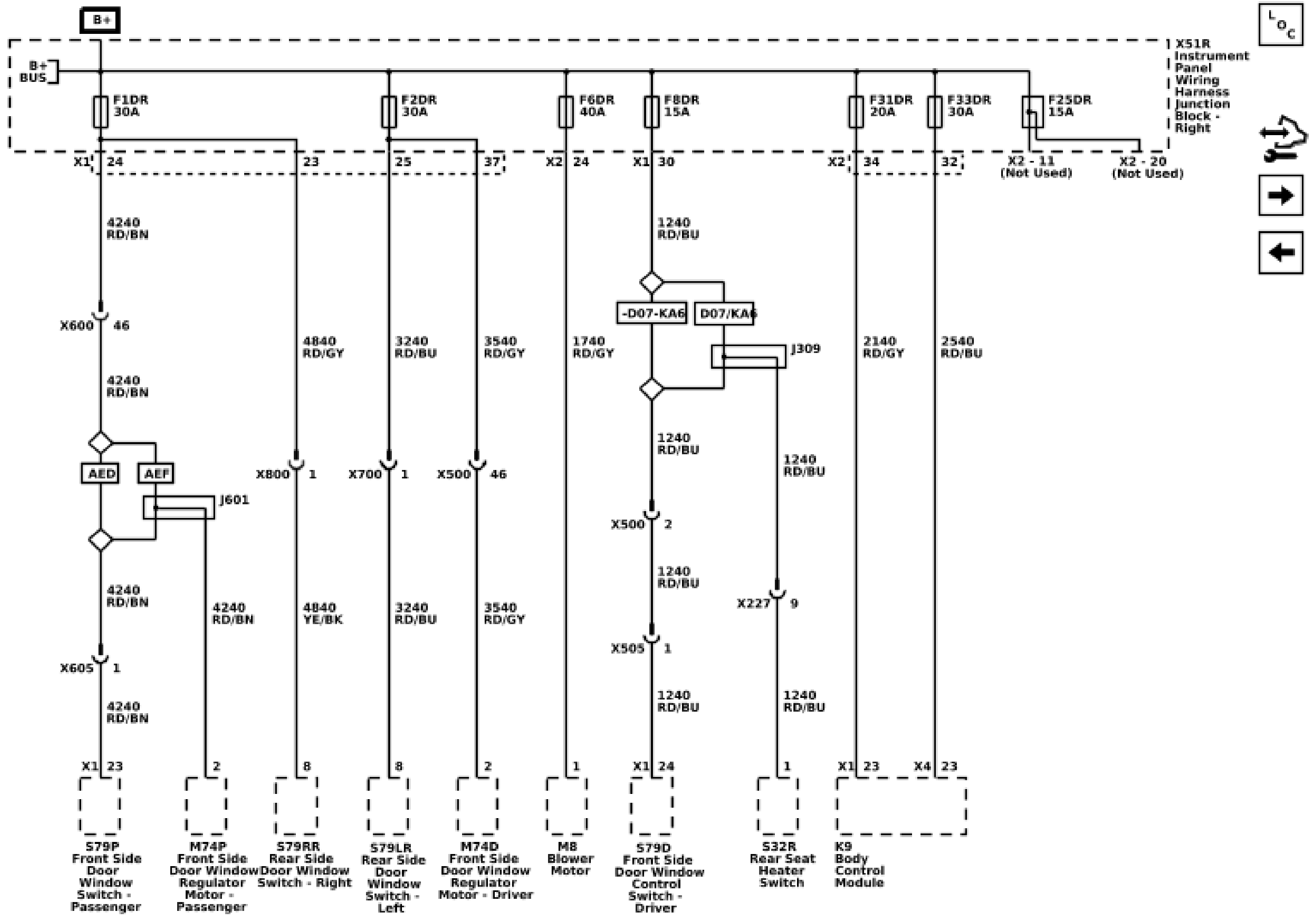

B+
X50B Battery Distribution Engine Compartment Fuse Block
F7BA 60A
F8BA 60A
X7 A
X8 A
1442 RD/YE
342 RD/WH
X1 19
20
X51R Instrument Panel Wiring Harness Junction Block - Right
F1DR 30A
F2DR 30A
F56DR 40A
F57DR 40A
F6DR 40A
F30DR 10A
F11DR 10A
F32DR 15A
F12DR 10A
F55DR 30A
F8DR 15A
F22DR 7.5A
F51DR 40A
F52DR 40A
F25DR 15A
F4DR 15A
F5DR 15A
30
KR76 Accessory Time Delay Cutoff Relay
87
F27DR 50A
F26DR 10A
CB1DR 15A

6846352

Power Distribution Schematics (CB1DR Circuit Breaker, F26DR, F30DR, and F32DR Fuses)

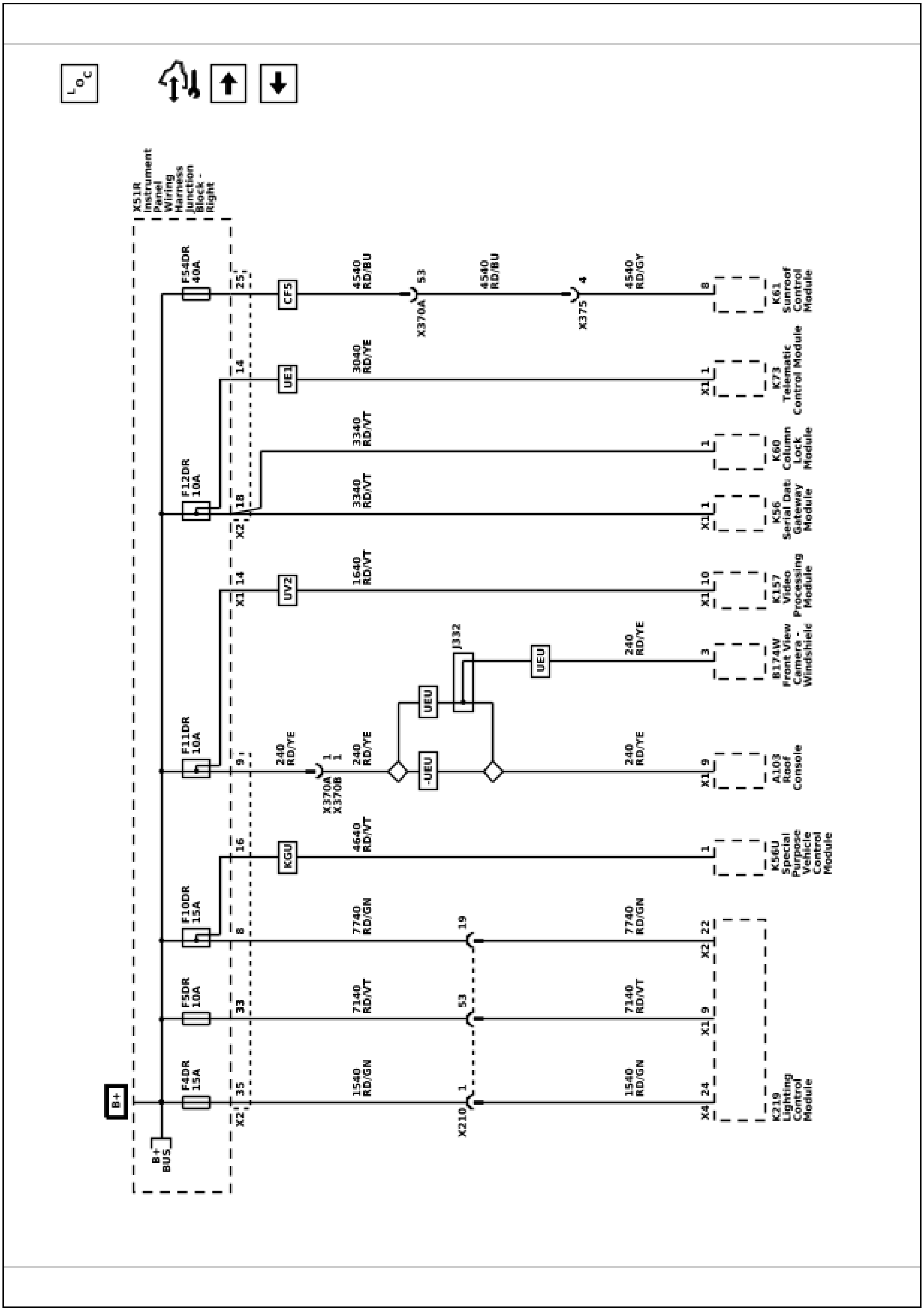

X51R
Instrument Panel Wiring Harness Junction Block - Right
B+
B+ BUS
30
KR76
Accessory Time Delay Cutoff Relay
87
F30DR 10A
F32DR 15A
F26DR 10A
CB1DR 15A
X2 28
X1 5
X2 27
X1 4
X1 - 8 (Not Used)
X3 - 10 (Not Used)
X1 - 7 (Not Used)
X1 6
X2 31
B117A
Windshield Outside Moisture/ Ambient Light and Humidity Sensor
1
1340 RD/WH
CE1
J212
UV6
IOK
4440 RD/GN
J323
X336 23
2340 RD/YE
2640 RD/VT
-D07
D07
J304
X227 6
X210 59
-K4C
K4C
J337
UBI
4701 VT
X227 48
AZ3
KC5
1001 VT
X1 7
X1 6
1
X1 1
X1 56
X5 1
A
P16 Instrumen Panel Cluster Control Module
P29 Head-Up Display
A26 Heater and Ai Conditioning User Interface Control - Fron
A22 Radio Control
K36 Restraints Control Module
K85P Restraints Occupant Classification System Module - Passenger
A11 Radio
S76 Trailer Brake Control Switch
K77 Remote Function Actuator Module
X92IP USB 2 Port Receptacle - Instrument Panel
X83B Audio/Video Receptacle
T22 Wireless Accessory Charging Module
(D07+UBI) X92CD Dual Charge Only Receptacle - Floor Console Rear
(AZ3+UBI) X92FSR Dual Charge Only Receptacle - Front Center Seat Rear Cover
(KC5) X80G Accessory Power Receptacle - Instrument Panel
6846353

Power Distribution Schematics (F1DR, F2DR, F6DR, F8DR, F25DR, F31DR, and F33DR Fuses)

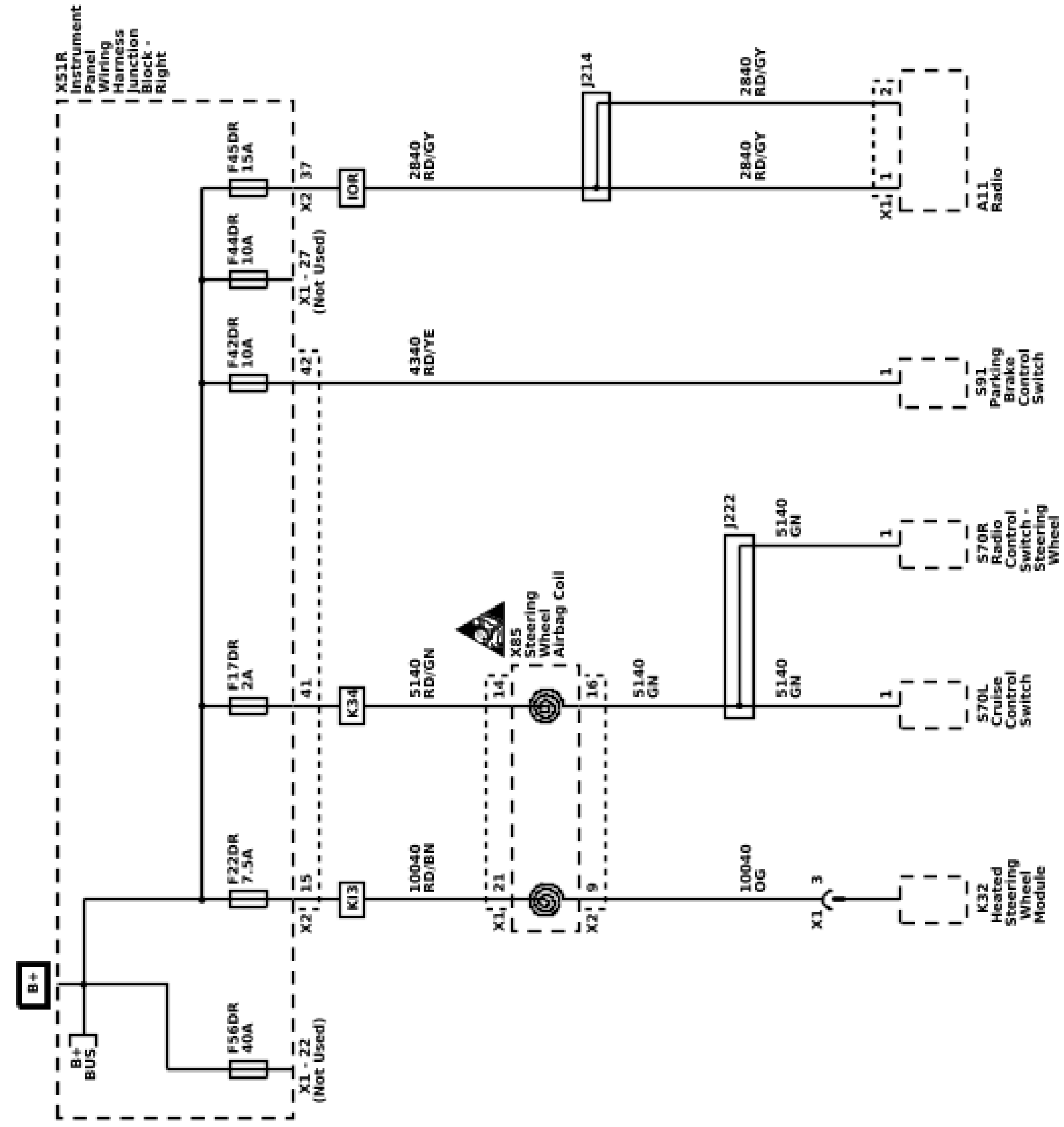

B+
B+ BUS
X51R Instrument Panel Wiring Harness Junction Block - Right
F1DR 30A
F2DR 30A
F6DR 40A
F8DR 15A
F31DR 20A
F33DR 30A
F25DR 15A
X1 24
23
25
37
X2 24
X1 30
X2 34
32
X2 - 11 (Not Used)
X2 - 20 (Not Used)
4240 RD/BN
X600 46
4240 RD/BN
AED
AEF
J601
4240 RD/BN
X605 1
4240 RD/BN
4240 RD/BN
4840 RD/GY
X800 1
4840 YE/BK
3240 RD/BU
X700 1
3240 RD/BU
3540 RD/GY
X500 46
3540 RD/GY
1740 RD/GY
1240 RD/BU
-D07-KA6
D07/KA6
J309
1240 RD/BU
X500 2
1240 RD/BU
X505 1
1240 RD/BU
1240 RD/BU
X227 9
1240 RD/BU
2140 RD/GY
2540 RD/BU
X1 23
2
8
8
2
1
X1 24
1
X1 23
X4 23
S79P Front Side Door Window Switch - Passenger
M74P Front Side Door Window Regulator Motor - Passenger
S79RR Rear Side Door Window Switch - Right
S79LR Rear Side Door Window Switch - Left
M74D Front Side Door Window Regulator Motor - Driver
M8 Blower Motor
S79D Front Side Door Window Control Switch - Driver
S32R Rear Seat Heater Switch
K9 Body Control Module
L O C

6846354

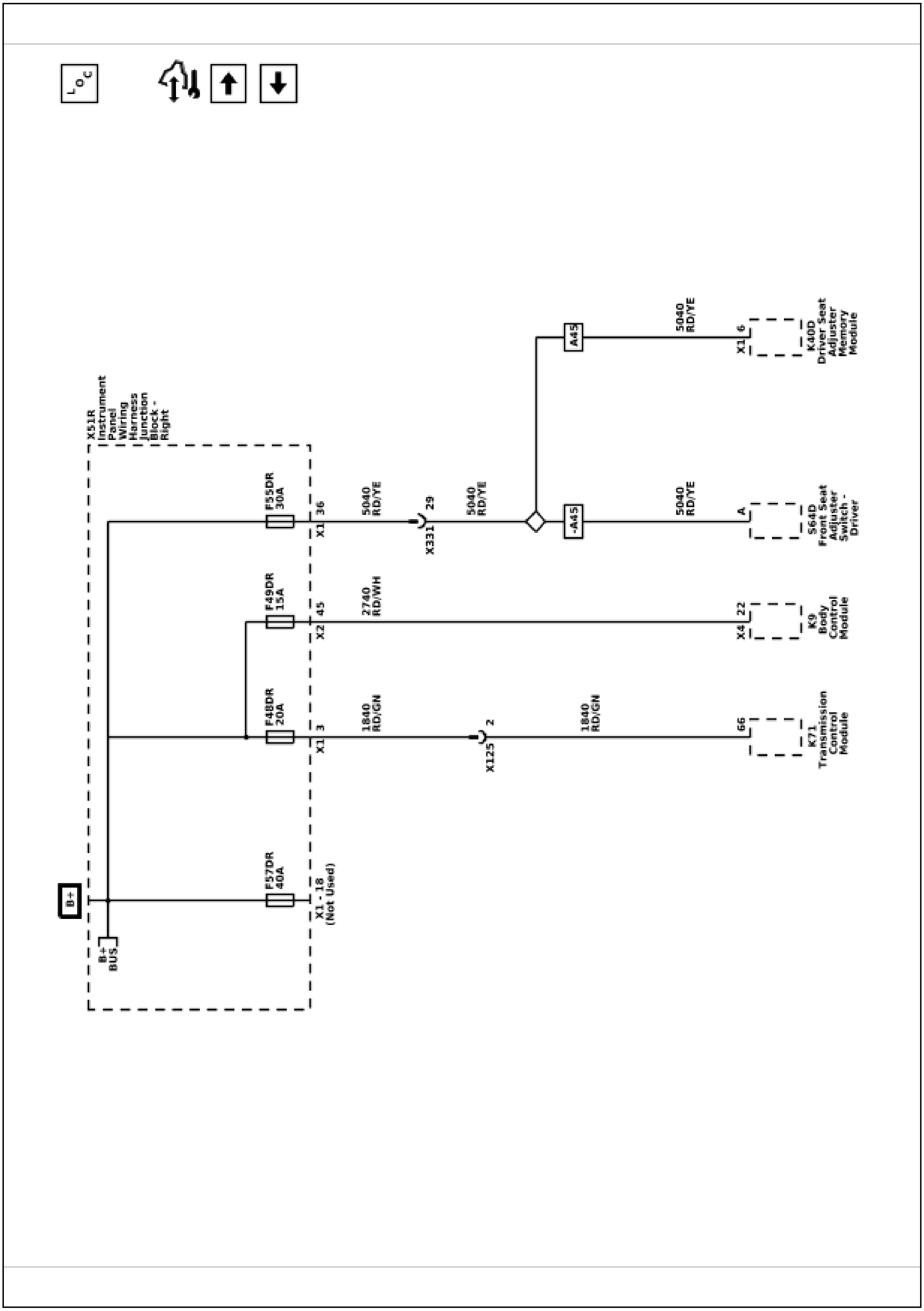
Power Distribution Schematics (F4DR, F5DR, F10DR, F11DR, F12DR, and F54DR Fuses)


6846355
X51R Instrument Panel Wiring Harness Junction Block - Right
B+
B+ BUS
F4DR 15A
F5DR 10A
F10DR 15A
F11DR 10A
F12DR 10A
F54DR 40A
X2 35
33
8
16
9
X1 14
X2 18
14
25
CF5
UE1
UV2
KGU
UEU
-UEU
J332
1540 RD/GN
7140 RD/VT
7740 RD/GN
4640 RD/VT
240 RD/YE
1640 RD/VT
3340 RD/VT
3040 RD/YE
4540 RD/BU
4540 RD/GY
X210 1
53
19
X370A X370B 1 1
X370A 53
X375 4
X4 24
X1 9
X2 22
K219 Lighting Control Module
1
K56U Special Purpose Vehicle Control Module
X1 9
A103 Roof Console
3
B174W Front View Camera - Windshield
X1 10
K157 Video Processing Module
X1 1
K56 Serial Data Gateway Module
1
K60 Column Lock Module
X1 1
K73 Telematic Control Module
8
K61 Sunroof Control Module

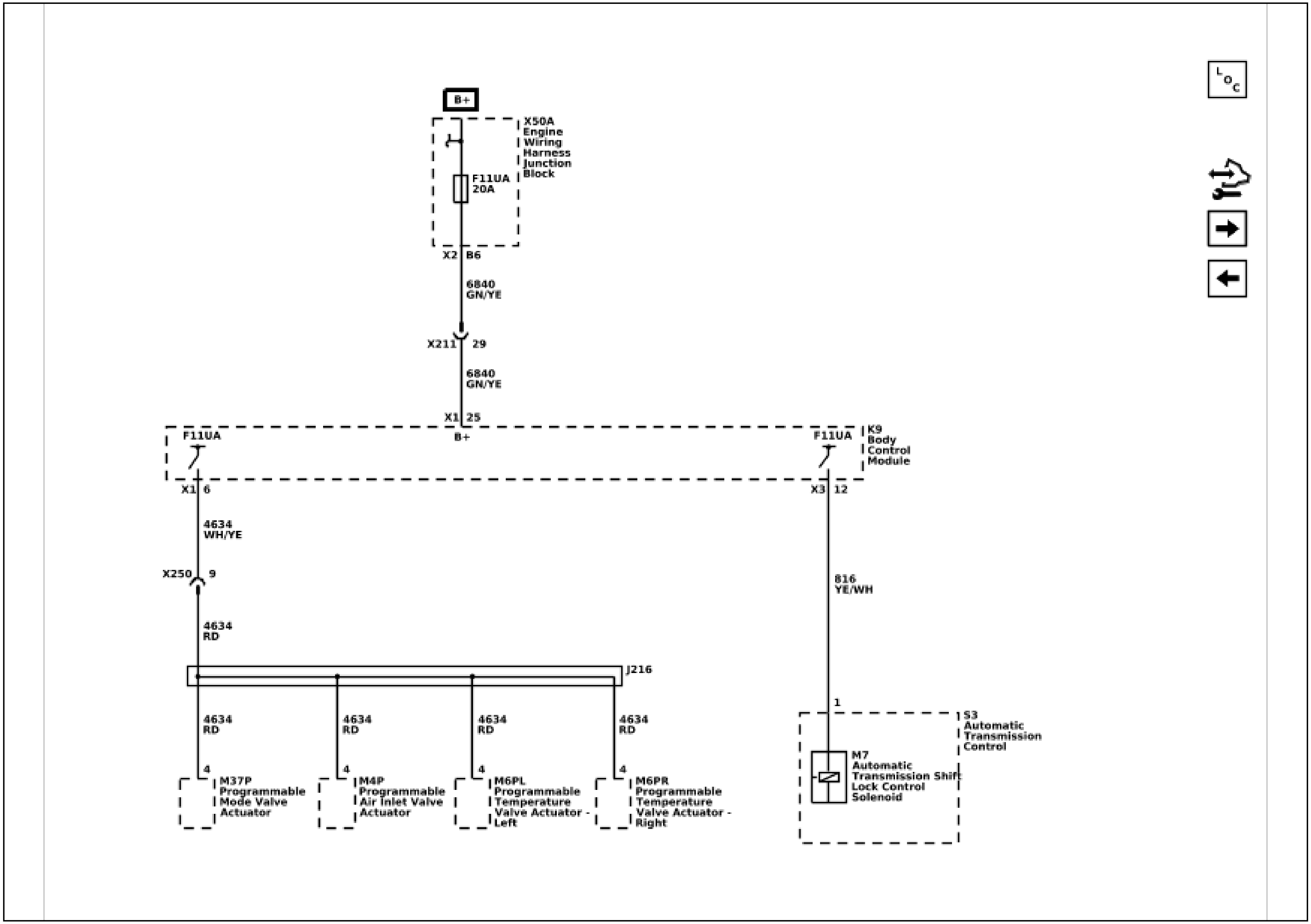
Power Distribution Schematics (F17DR, F22DR, F42DR, F44DR, F45DR, and F56DR Fuses)


6846356
X51R Instrument Panel Wiring Harness Junction Block - Right
B+
B+ BUS
F56DR 40A
X1 - 22 (Not Used)
F22DR 7.5A
X2 15
KI3
10040 RD/BN
X1 21
X2 9
10040 OG
X1 3
K32 Heated Steering Wheel Module
F17DR 2A
41
K34
5140 RD/GN
14
16
X85 Steering Wheel Airbag Coil
5140 GN
J222
5140 GN
1
S70L Cruise Control Switch
5140 GN
1
S70R Radio Control Switch - Steering Wheel
F42DR 10A
42
4340 RD/YE
1
S91 Parking Brake Control Switch
F44DR 10A
X1 - 27 (Not Used)
F45DR 15A
X2 37
IOR
2840 RD/GY
J214
2840 RD/GY
2840 RD/GY
X1 1
2
A11 Radio

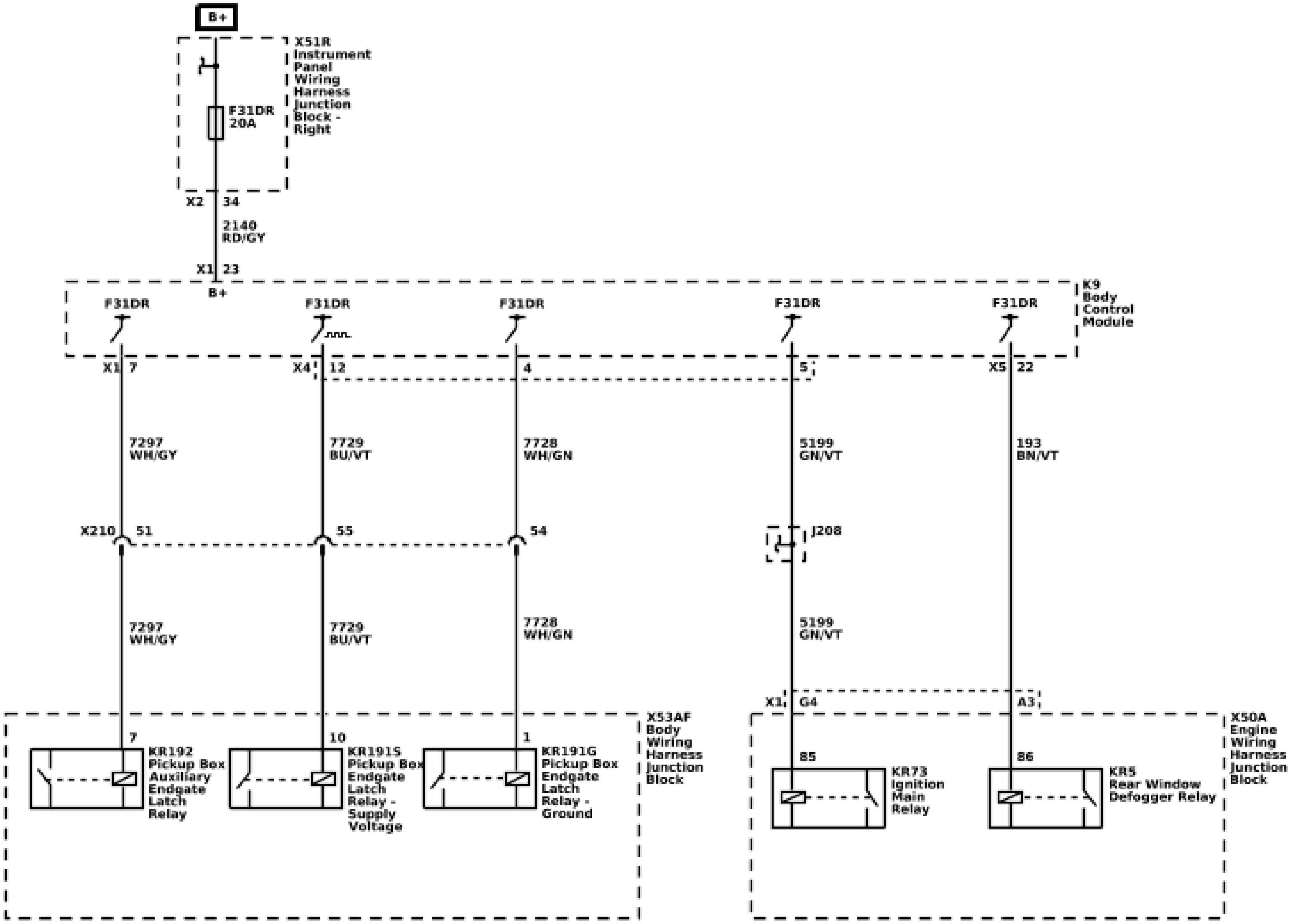
Power Distribution Schematics (F48DR, F49DR, F55DR, and F57DR Fuses)


6846357
X51R Instrument Panel Wiring Harness Junction Block - Right
B+
B+ BUS
F57DR 40A
X1 - 18 (Not Used)
F48DR 20A
X1 3
1840 RD/GN
X125 2
1840 RD/GN
66
K71 Transmission Control Module
F49DR 15A
X2 45
2740 RD/WH
X4 22
K9 Body Control Module
F55DR 30A
X1 36
5040 RD/YE
X331 29
5040 RD/YE
-A45
5040 RD/YE
A
S64D Front Seat Adjuster Switch - Driver
A45
5040 RD/YE
X1 6
K40D Driver Seat Adjuster Memory Module

Power Distribution Schematics (Body Control Module High Side Drives - F11UA Fuse)

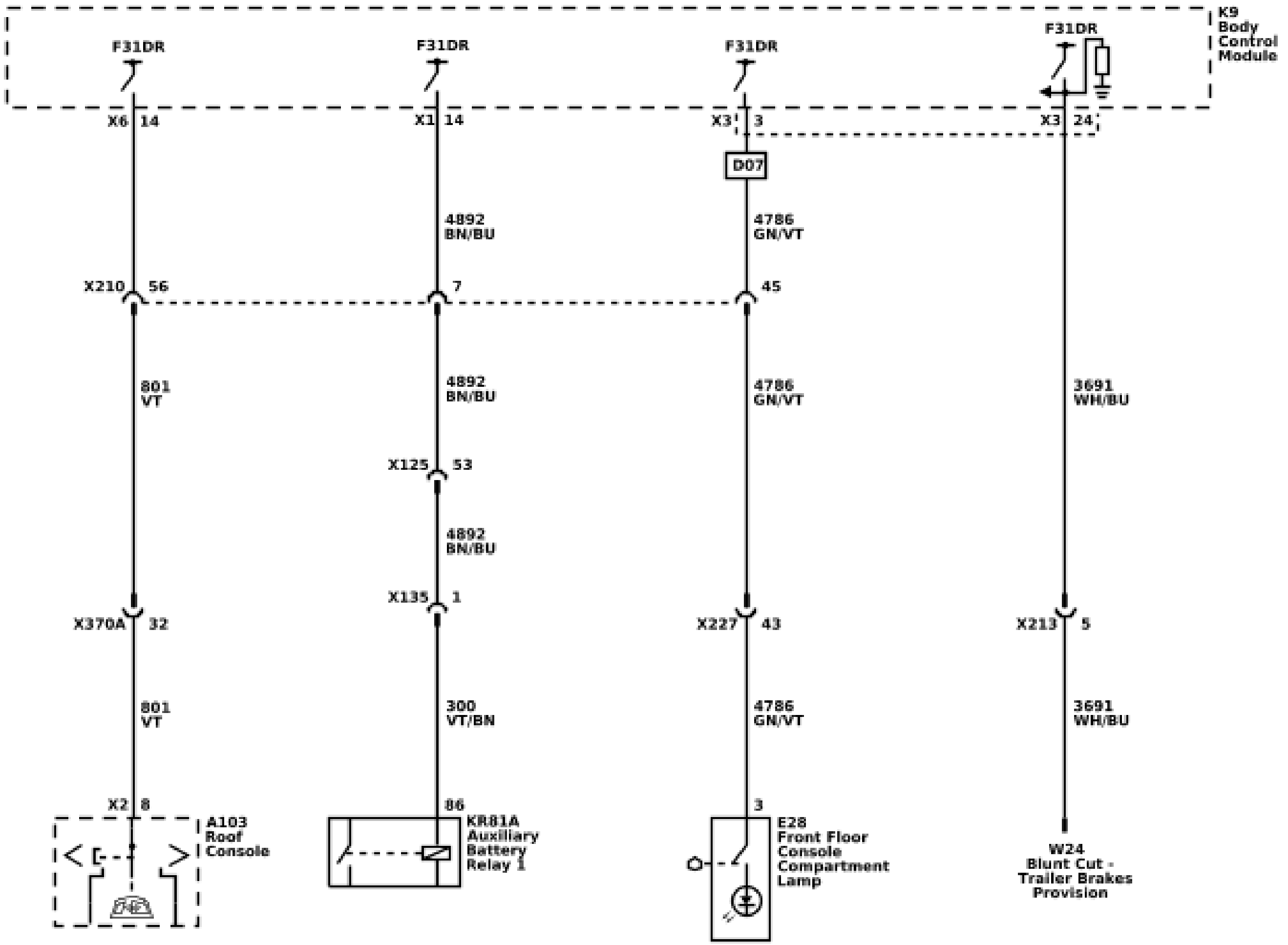

B+
X50A Engine Wiring Harness Junction Block
F11UA 20A
X2 B6
6840 GN/YE
X211 29
6840 GN/YE
X1 25
B+
F11UA
F11UA
K9 Body Control Module
X1 6
X3 12
4634 WH/YE
X250 9
4634 RD
816 YE/WH
J216
1
4634 RD
4634 RD
4634 RD
4634 RD
4
4
4
4
S3 Automatic Transmission Control
M7 Automatic Transmission Shift Lock Control Solenoid
M37P Programmable Mode Valve Actuator
M4P Programmable Air Inlet Valve Actuator
M6PL Programmable Temperature Valve Actuator - Left
M6PR Programmable Temperature Valve Actuator - Right
6846358

Power Distribution Schematics (Body Control Module High Side Drives - F31DR Fuse - 1 of 2)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F31DR 20A
X2 34
2140 RD/GY
X1 23
B+
K9 Body Control Module
F31DR
F31DR
F31DR
F31DR
F31DR
X1 7
X4 12
4
5
X5 22
7297 WH/GY
7729 BU/VT
7728 WH/GN
5199 GN/VT
193 BN/VT
X210 51
55
54
J208
7297 WH/GY
7729 BU/VT
7728 WH/GN
5199 GN/VT
X1 G4
A3
X53AF Body Wiring Harness Junction Block
7
10
1
KR192 Pickup Box Auxiliary Endgate Latch Relay
KR191S Pickup Box Endgate Latch Relay - Supply Voltage
KR191G Pickup Box Endgate Latch Relay - Ground
X50A Engine Wiring Harness Junction Block
85
86
KR73 Ignition Main Relay
KR5 Rear Window Defogger Relay

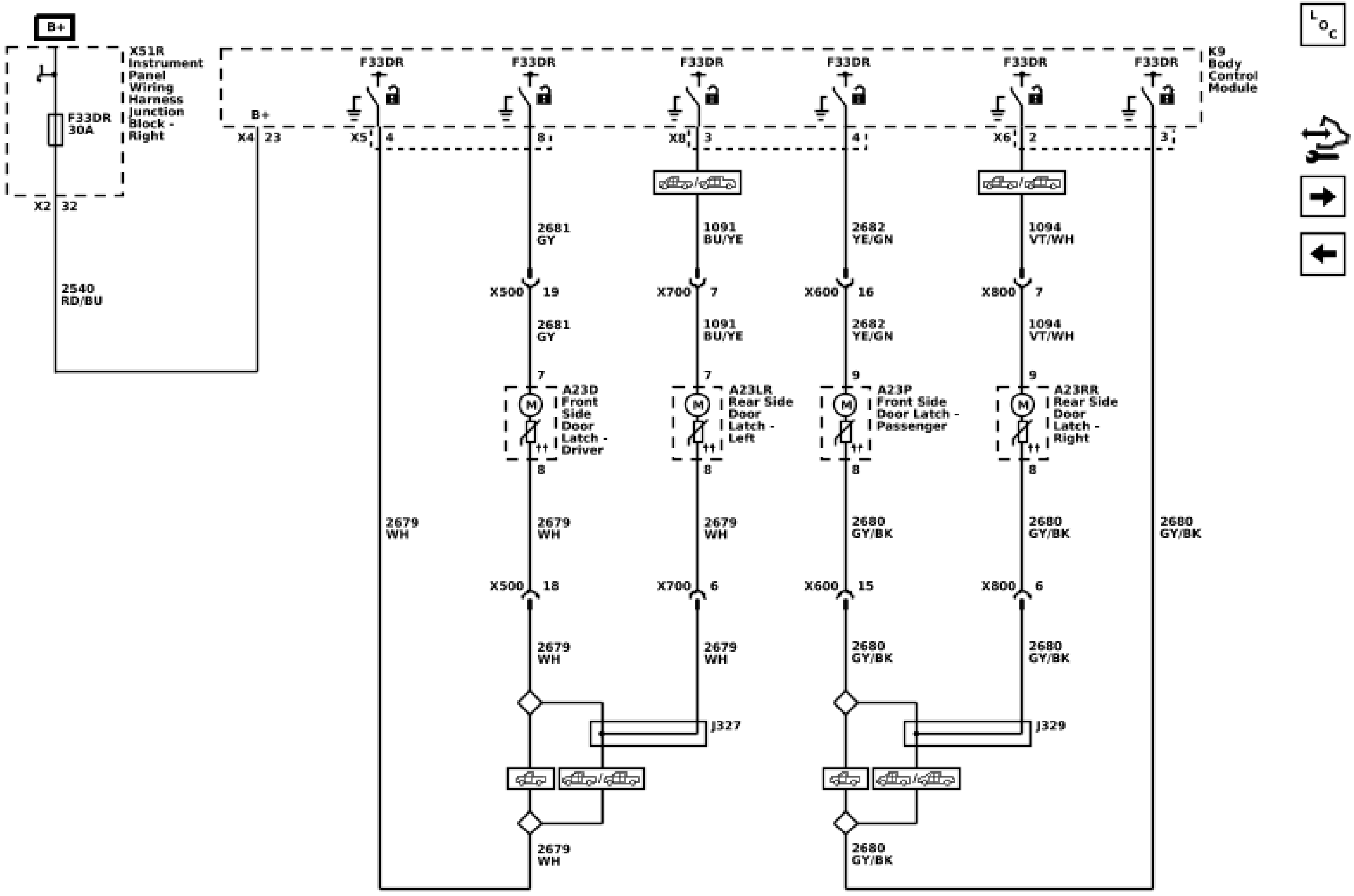
6846359

Power Distribution Schematics (Body Control Module High Side Drives - F31DR Fuse - 2 of 2)


K9
Body
Control
Module
F31DR
F31DR
F31DR
F31DR
X6 14
X1 14
X3 3
X3 24
D07
4892
BN/BU
4786
GN/VT
X210 56
7
45
801
VT
4892
BN/BU
4786
GN/VT
3691
WH/BU
X125 53
4892
BN/BU
X370A 32
X135 1
X227 43
X213 5
801
VT
300
VT/BN
4786
GN/VT
3691
WH/BU
X2 8
A103
Roof
Console
86
KR81A
Auxiliary
Battery
Relay 1
3
E28
Front Floor
Console
Compartment
Lamp
W24
Blunt Cut -
Trailer Brakes
Provision

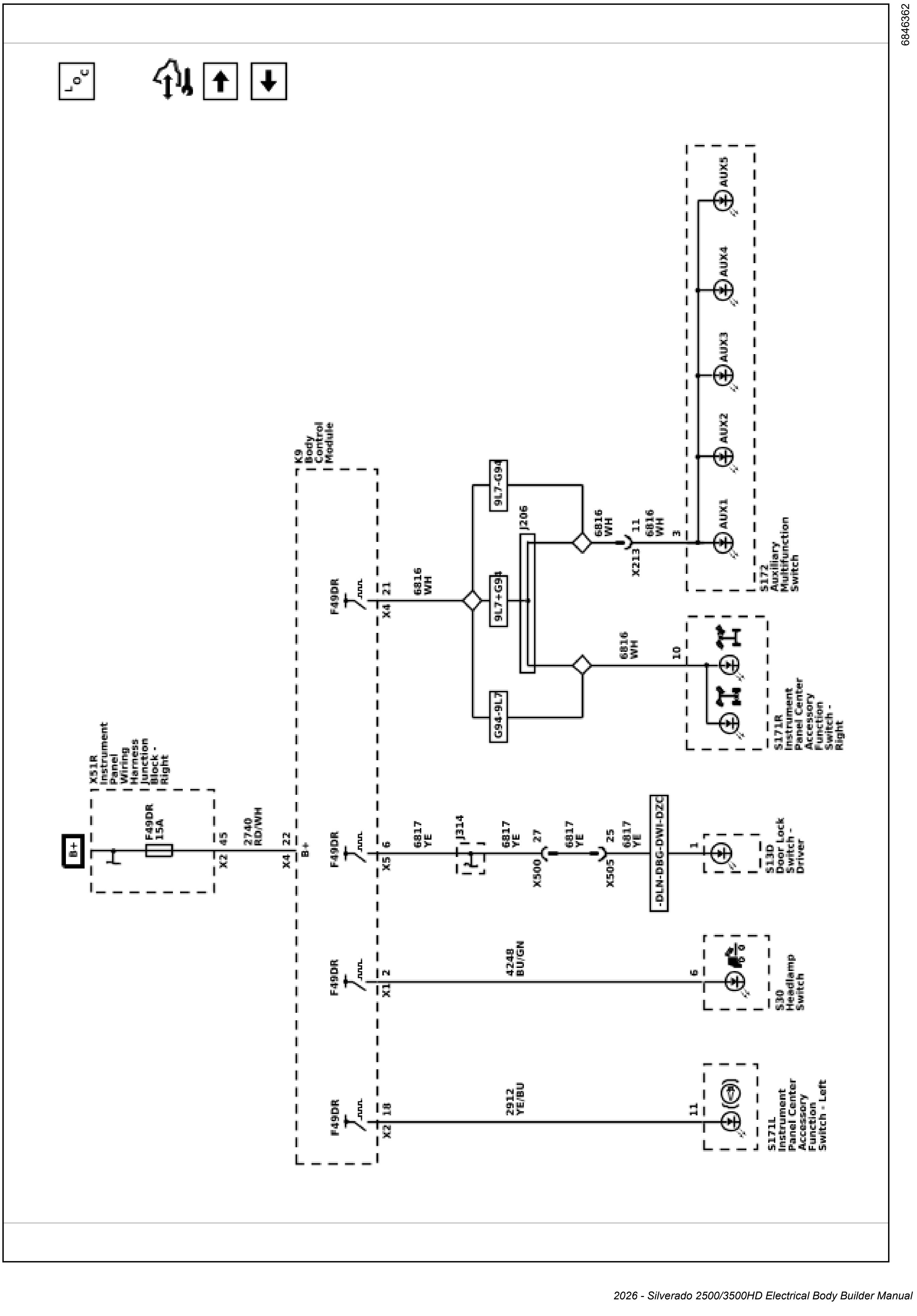
6846360

Power Distribution Schematics (Body Control Module High Side Drives - F33DR Fuse)

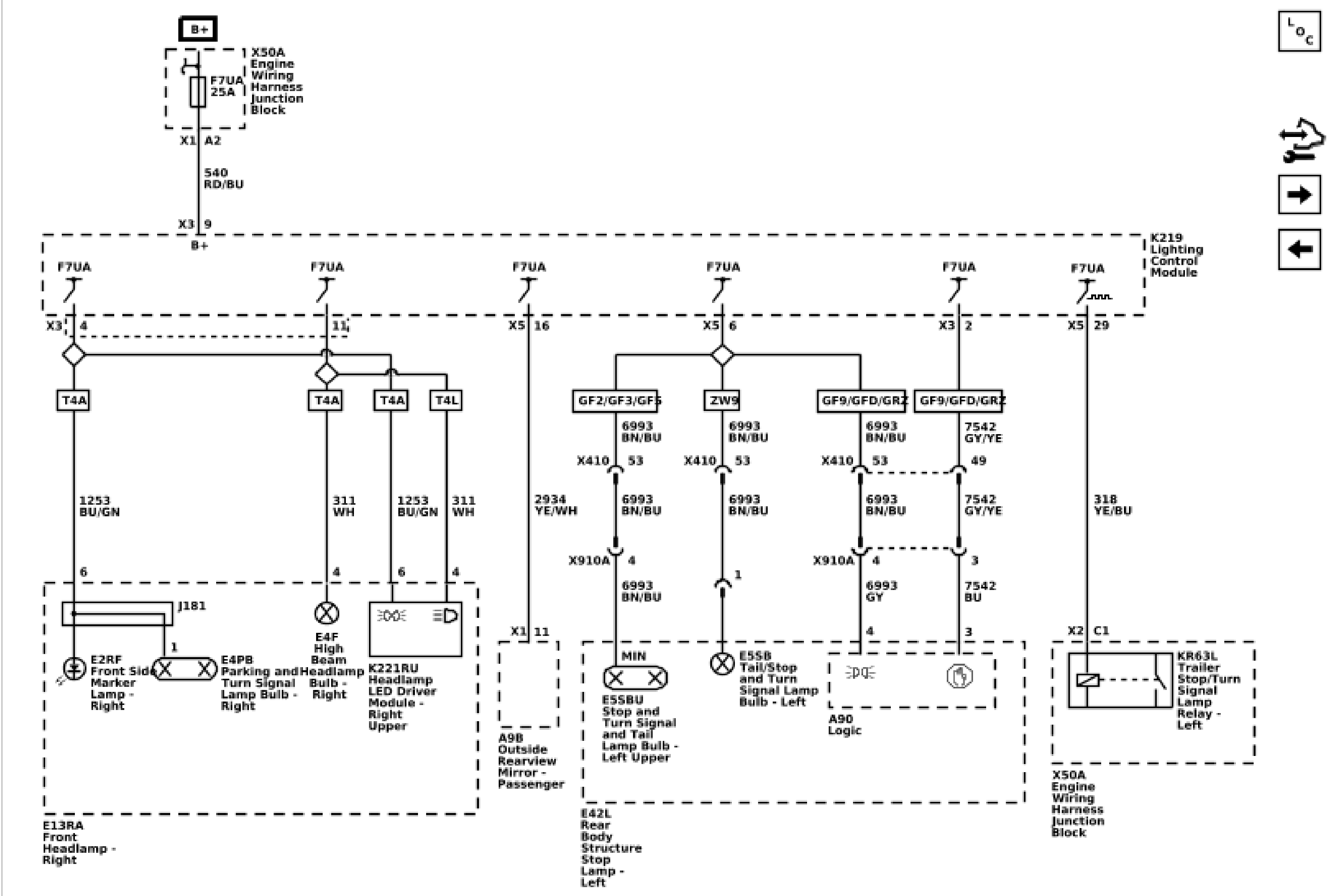

B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F33DR 30A
X2 32
2540 RD/BU
K9 Body Control Module
B+
X4 23
F33DR
X5 4
X6 2
X8 3
8
4
3
2681 GY
X500 19
A23D Front Side Door Latch - Driver
1091 BU/YE
X700 7
A23LR Rear Side Door Latch - Left
2682 YE/GN
X600 16
A23P Front Side Door Latch - Passenger
1094 VT/WH
X800 7
A23RR Rear Side Door Latch - Right
M
7
9
8
2679 WH
X500 18
X700 6
2680 GY/BK
X600 15
X800 6
J327
J329

6846361

Power Distribution Schematics (Body Control Module High Side Drives - F49DR Fuse)

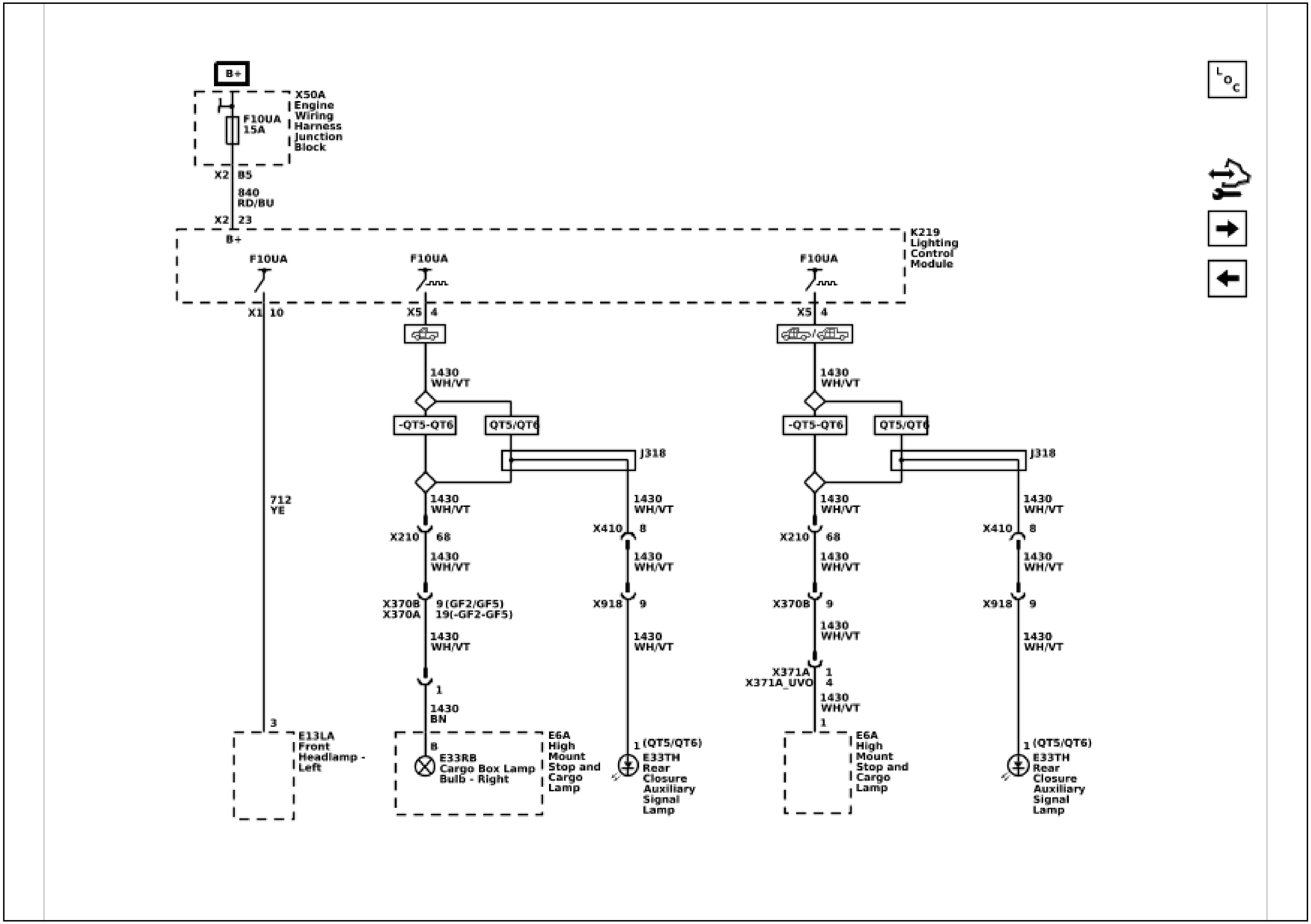

6846362
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F49DR 15A
X2 45
2740 RD/WH
X4 22 B+
K9 Body Control Module
F49DR
X2 18
2912 YE/BU
11
S171L Instrument Panel Center Accessory Function Switch - Left
F49DR
X1 2
4248 BU/GN
6
S30 Headlamp Switch
F49DR
X5 6
6817 YE
J314
6817 YE
27
X500
6817 YE
25
X505
6817 YE
-DLN-DBG-DWI-DZC
1
S13D Door Lock Switch - Driver
F49DR
X4 21
6816 WH
G94-9L7
9L7+G94
9L7-G94
J206
6816 WH
10
S171R Instrument Panel Center Accessory Function Switch - Right
6816 WH
11
X213
6816 WH
3
AUX1
AUX2
AUX3
AUX4
AUX5
S172 Auxiliary Multifunction Switch

Power Distribution Schematics (Lighting Control Module High Side Drives - F7UA Fuse)


B+
X50A Engine Wiring Harness Junction Block
F7UA 25A
X1 A2
540 RD/BU
X3 9
B+
K219 Lighting Control Module
F7UA
X3 4
X3 11
X5 16
X5 6
X3 2
X5 29
T4A
T4A
T4A
T4L
GF2/GF3/GF5
ZW9
GF9/GFD/GRZ
GF9/GFD/GRZ
1253 BU/GN
311 WH
1253 BU/GN
311 WH
2934 YE/WH
6993 BN/BU
7542 GY/YE
X410 53
X410 49
X910A 4
X910A 3
1
6993 GY
7542 BU
318 YE/BU
6
4
6
4
J181
1
E2RF Front Side Marker Lamp - Right
E4PB Parking and Turn Signal Lamp Bulb - Right
E4F High Beam Headlamp Bulb - Right
K221RU Headlamp LED Driver Module - Right Upper
E13RA Front Headlamp - Right
X1 11
A9B Outside Rearview Mirror - Passenger
MIN
E55BU Stop and Turn Signal and Tail Lamp Bulb - Left Upper
E55B Tail/Stop and Turn Signal Lamp Bulb - Left
4
3
A90 Logic
E42L Rear Body Structure Stop Lamp - Left
X2 C1
KR63L Trailer Stop/Turn Signal Lamp Relay - Left
X50A Engine Wiring Harness Junction Block
L O C

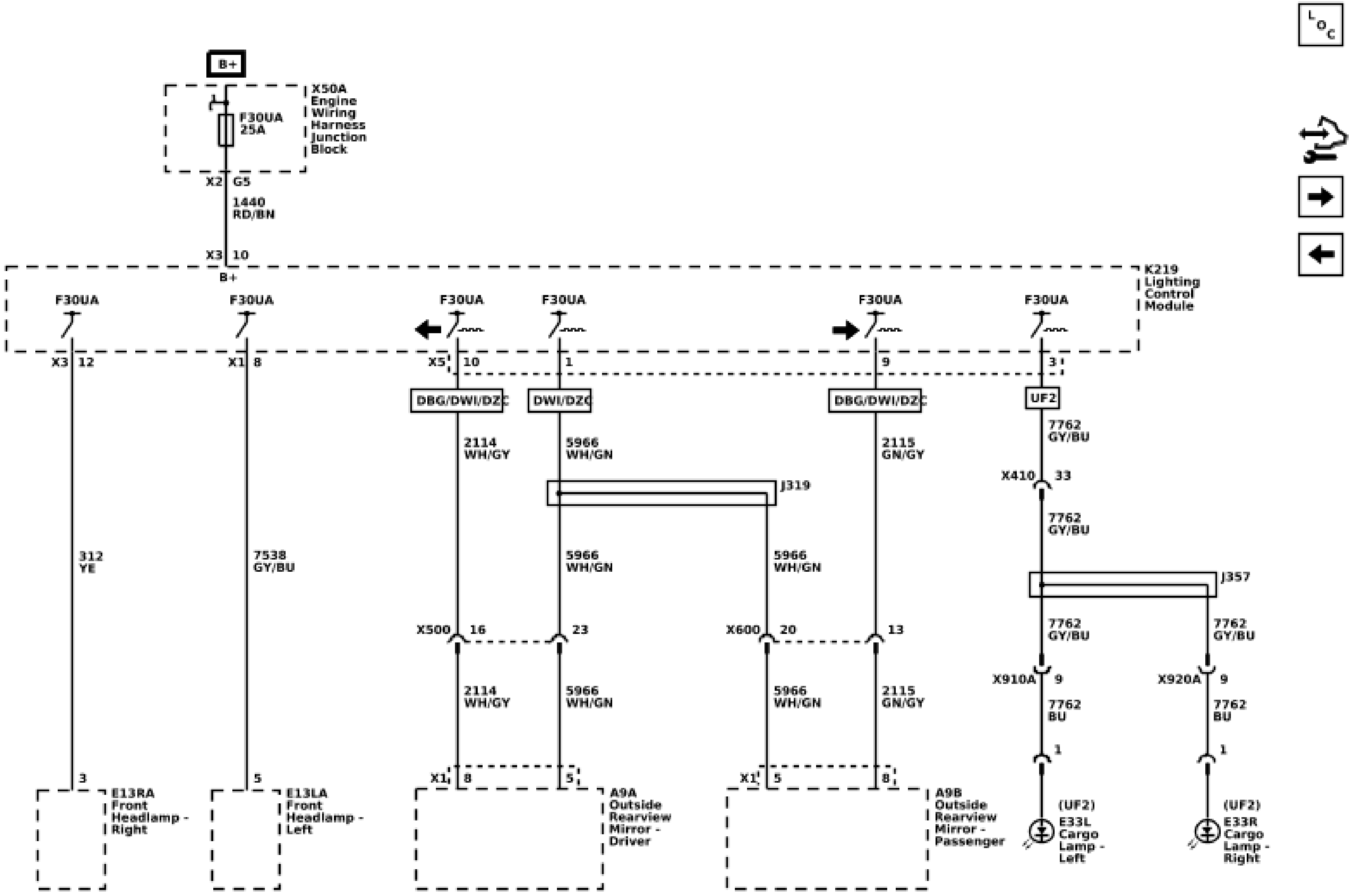
6846363

Power Distribution Schematics (Lighting Control Module High Side Drives - F10UA Fuse)

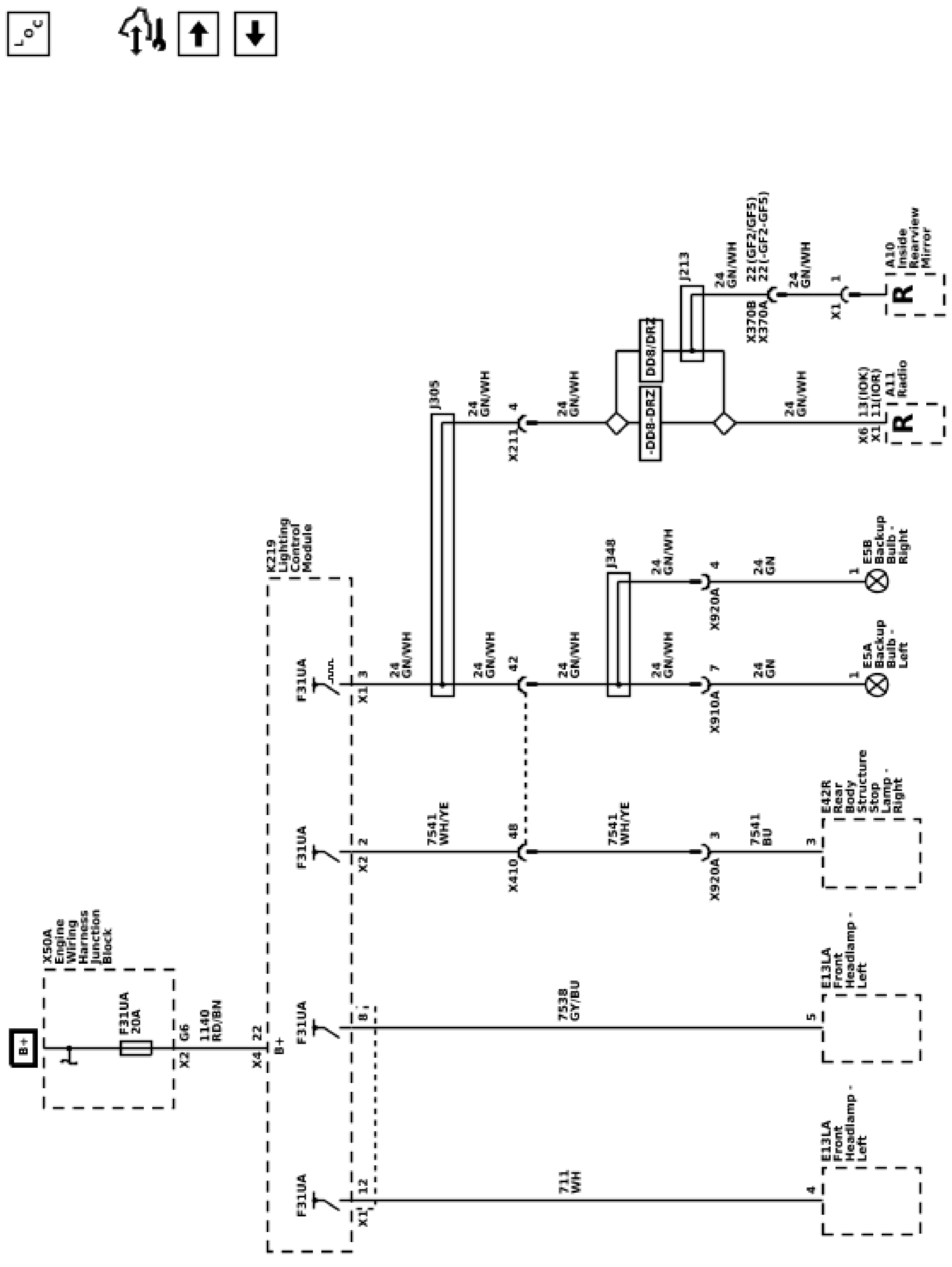

B+
X50A Engine Wiring Harness Junction Block
F10UA 15A
X2 B5
840 RD/BU
X2 23
B+
K219 Lighting Control Module
F10UA
X1 10
712 YE
3
E13LA Front Headlamp - Left
F10UA
X5 4
1430 WH/VT
-QT5-QT6
QT5/QT6
J318
1430 WH/VT
X210 68
1430 WH/VT
X370B 9 (GF2/GF5)
X370A 19(-GF2-GF5)
1430 WH/VT
1
1430 BN
8
E33RB Cargo Box Lamp Bulb - Right
E6A High Mount Stop and Cargo Lamp
1430 WH/VT
X410 8
1430 WH/VT
X918 9
1430 WH/VT
1 (QT5/QT6)
E33TH Rear Closure Auxiliary Signal Lamp
F10UA
X5 4
1430 WH/VT
-QT5-QT6
QT5/QT6
J318
1430 WH/VT
X210 68
1430 WH/VT
X370B 9
1430 WH/VT
X371A 1
X371A_UVO 4
1430 WH/VT
1
E6A High Mount Stop and Cargo Lamp
1430 WH/VT
X410 8
1430 WH/VT
X918 9
1430 WH/VT
1 (QT5/QT6)
E33TH Rear Closure Auxiliary Signal Lamp

6846364

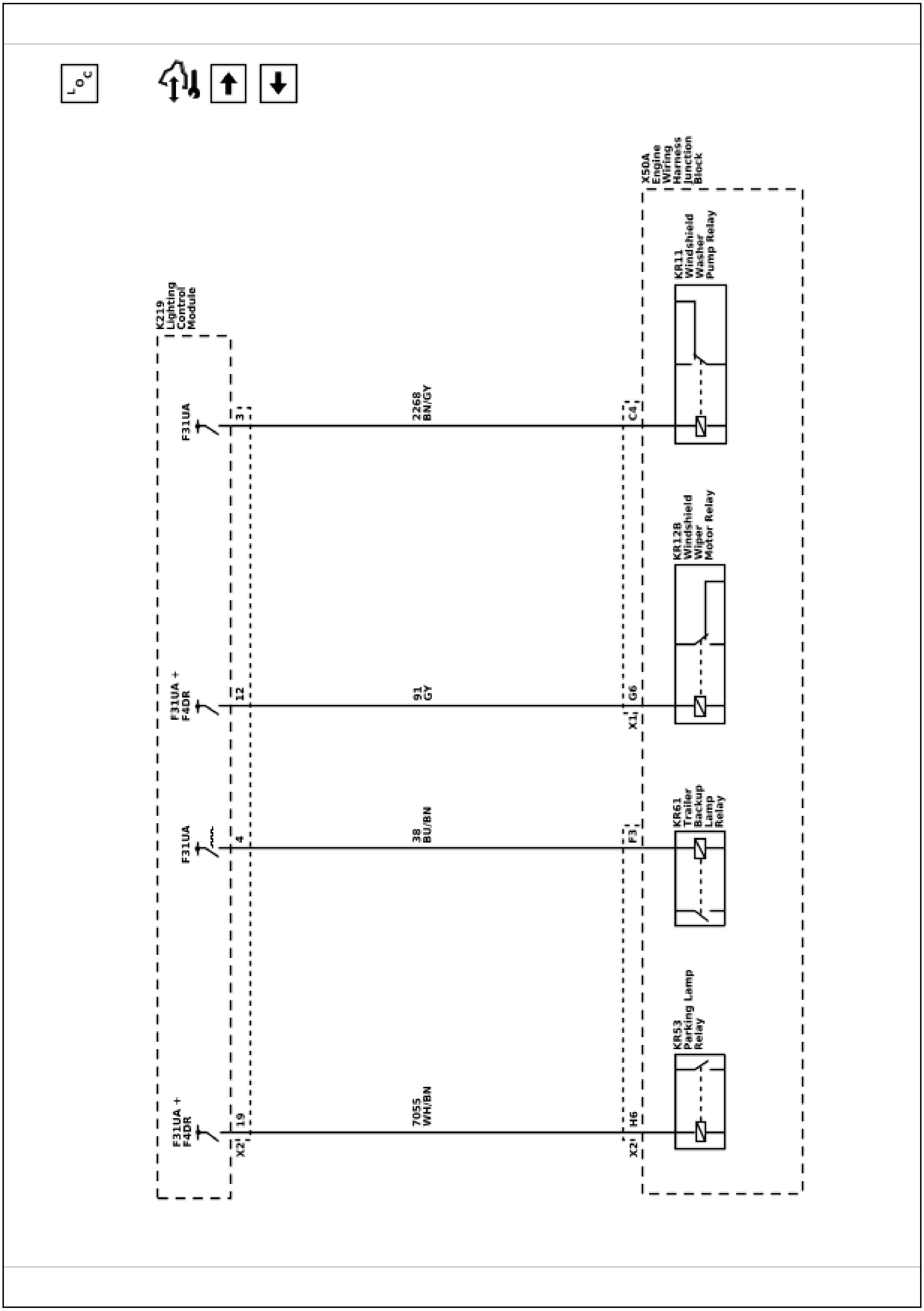
Power Distribution Schematics (Lighting Control Module High Side Drives - F30UA Fuse)


B+
X50A Engine Wiring Harness Junction Block
F30UA 25A
X2 G5
1440 RD/BN
X3 10
B+
K219 Lighting Control Module
F30UA
X3 12
X1 8
X5 10
1
9
3
DBG/DWI/DZC
DWI/DZC
UF2
312 YE
7538 GY/BU
2114 WH/GY
5966 WH/GN
2115 GN/GY
7762 GY/BU
J319
J357
X410 33
X500 16
23
X600 20
13
X910A 9
X920A 9
7762 BU
1
3
5
X1 8
5
X1 5
8
E13RA Front Headlamp - Right
E13LA Front Headlamp - Left
A9A Outside Rearview Mirror - Driver
A9B Outside Rearview Mirror - Passenger
(UF2) E33L Cargo Lamp - Left
(UF2) E33R Cargo Lamp - Right
6846365

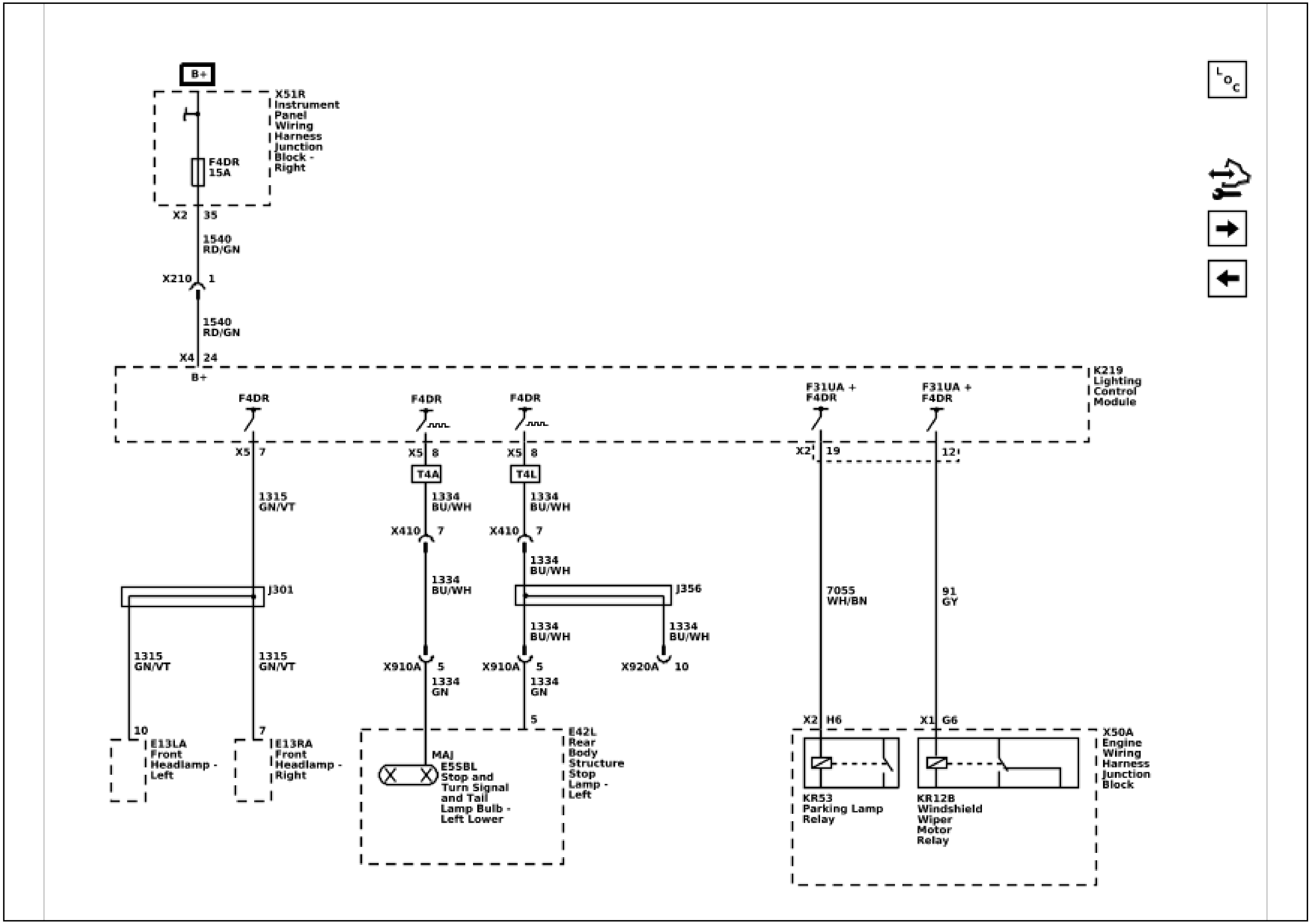
Power Distribution Schematics (Lighting Control Module High Side Drives - F31UA Fuse - 1 of 2)


6846366
B+
X50A Engine Wiring Harness Junction Block
F31UA 20A
X2 G6
1140 RD/BN
X4 22 B+
K219 Lighting Control Module
F31UA
X1 12
711 WH
4
E13LA Front Headlamp - Left
F31UA
8
7538 GY/BU
5
E13LA Front Headlamp - Left
F31UA
X2 2
7541 WH/YE
X410 48
7541 WH/YE
X920A 3
7541 BU
3
E42R Rear Body Structure Stop Lamp - Right
F31UA
X1 3
24 GN/WH
J305
24 GN/WH
X211 4
24 GN/WH
-DD8-DRZ
DD8/DRZ
J213
24 GN/WH
X370B 22(GF2/GF5)
X370A 22(-GF2-GF5)
24 GN/WH
X1 1
A10 Inside Rearview Mirror
24 GN/WH
X6 13(IOK)
X1 11(IOR)
A11 Radio
42
24 GN/WH
J348
24 GN/WH
X910A 7
24 GN
1
E5A Backup Bulb - Left
24 GN/WH
X920A 4
24 GN
1
E5B Backup Bulb - Right

Power Distribution Schematics (Lighting Control Module High Side Drives - F31UA Fuse - 2 of 2)

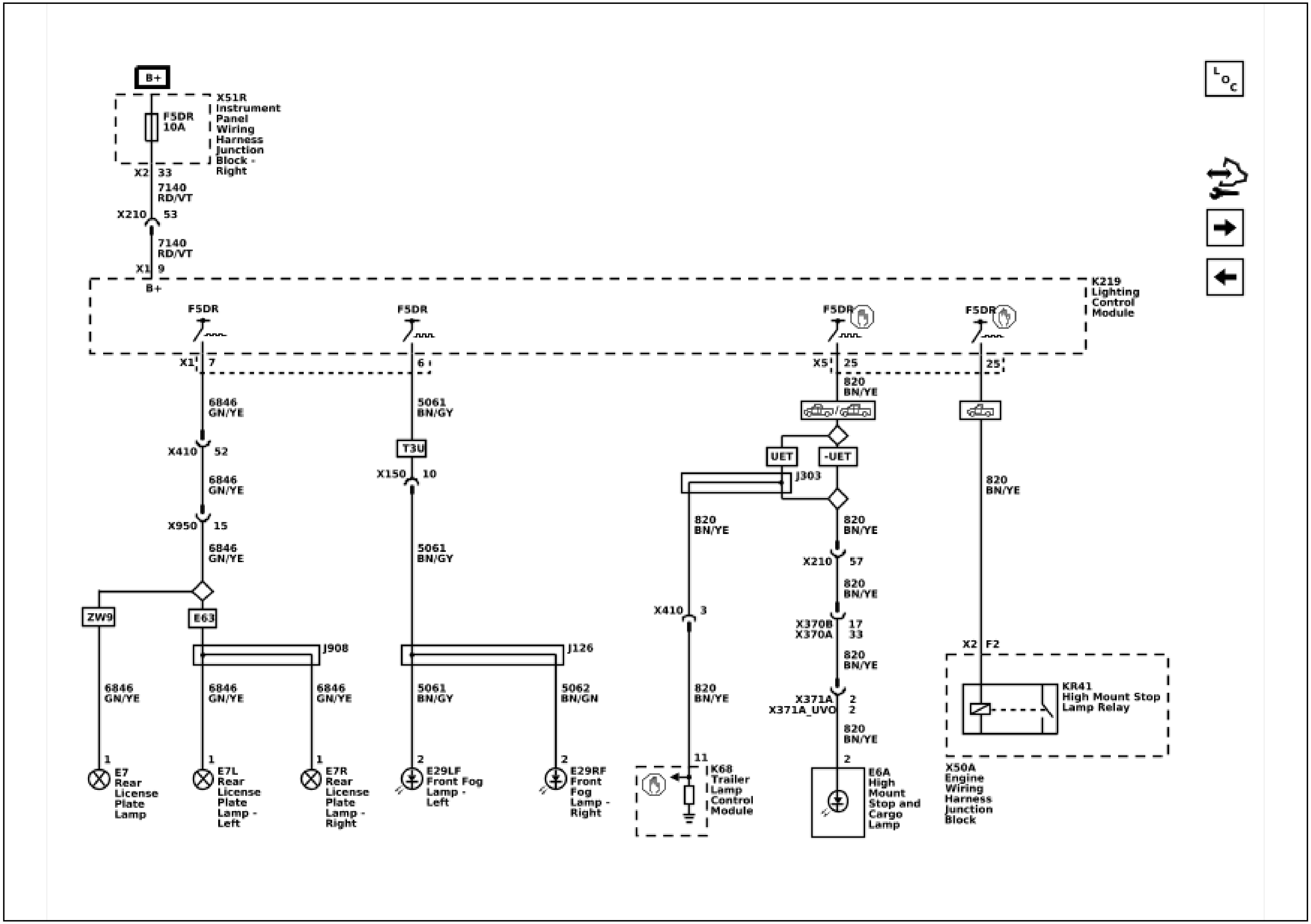

6846367
K219 Lighting Control Module
F31UA
3
2268 BN/GY
C4
X50A Engine Wiring Harness Junction Block
KR11 Windshield Washer Pump Relay
F31UA + F4DR
12
91 GY
X1
G6
KR12B Windshield Wiper Motor Relay
F31UA
4
38 BU/BN
F3
KR61 Trailer Backup Lamp Relay
F31UA + F4DR
X2
19
7055 WH/BN
X2
H6
KR53 Parking Lamp Relay

Power Distribution Schematics (Lighting Control Module High Side Drives - F4DR Fuse)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F4DR 15A
X2 35
1540 RD/GN
X210 1
1540 RD/GN
X4 24
B+
K219 Lighting Control Module
F4DR
F4DR
F4DR
F31UA + F4DR
F31UA + F4DR
X5 7
X5 8
X5 8
X2 19
12
T4A
T4L
1315 GN/VT
1334 BU/WH
1334 BU/WH
X410 7
X410 7
1334 BU/WH
1334 BU/WH
J301
J356
7055 WH/BN
91 GY
1315 GN/VT
1315 GN/VT
1334 BU/WH
1334 BU/WH
X910A 5
X910A 5
X920A 10
1334 GN
1334 GN
10
7
5
X2 H6
X1 G6
E13LA Front Headlamp - Left
E13RA Front Headlamp - Right
MAJ
E55BL Stop and Turn Signal and Tail Lamp Bulb - Left Lower
E42L Rear Body Structure Stop Lamp - Left
KR53 Parking Lamp Relay
KR12B Windshield Wiper Motor Relay
X50A Engine Wiring Harness Junction Block
LOC

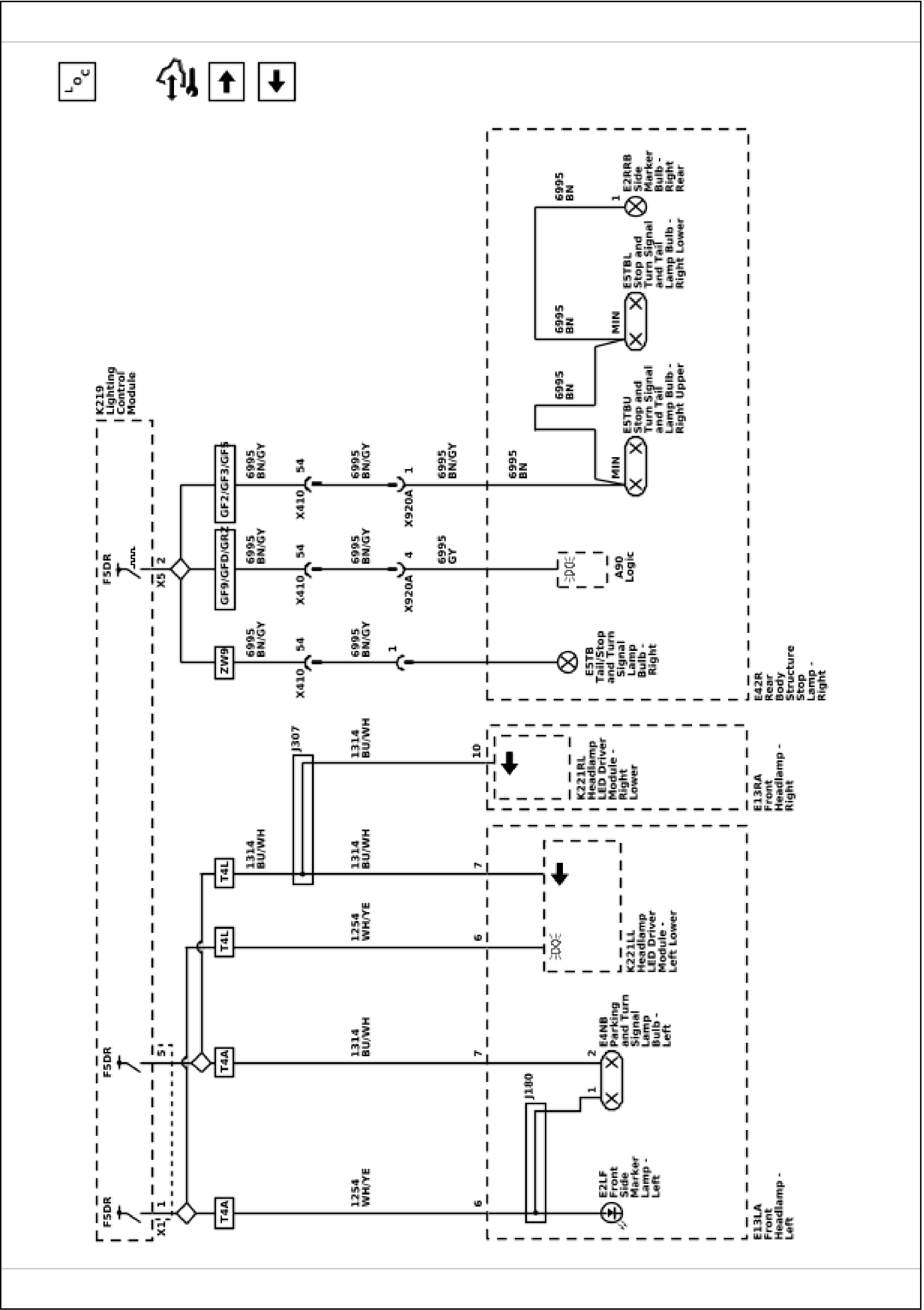
6846368

Power Distribution Schematics (Lighting Control Module High Side Drives - F5DR Fuse - 1 of 2)

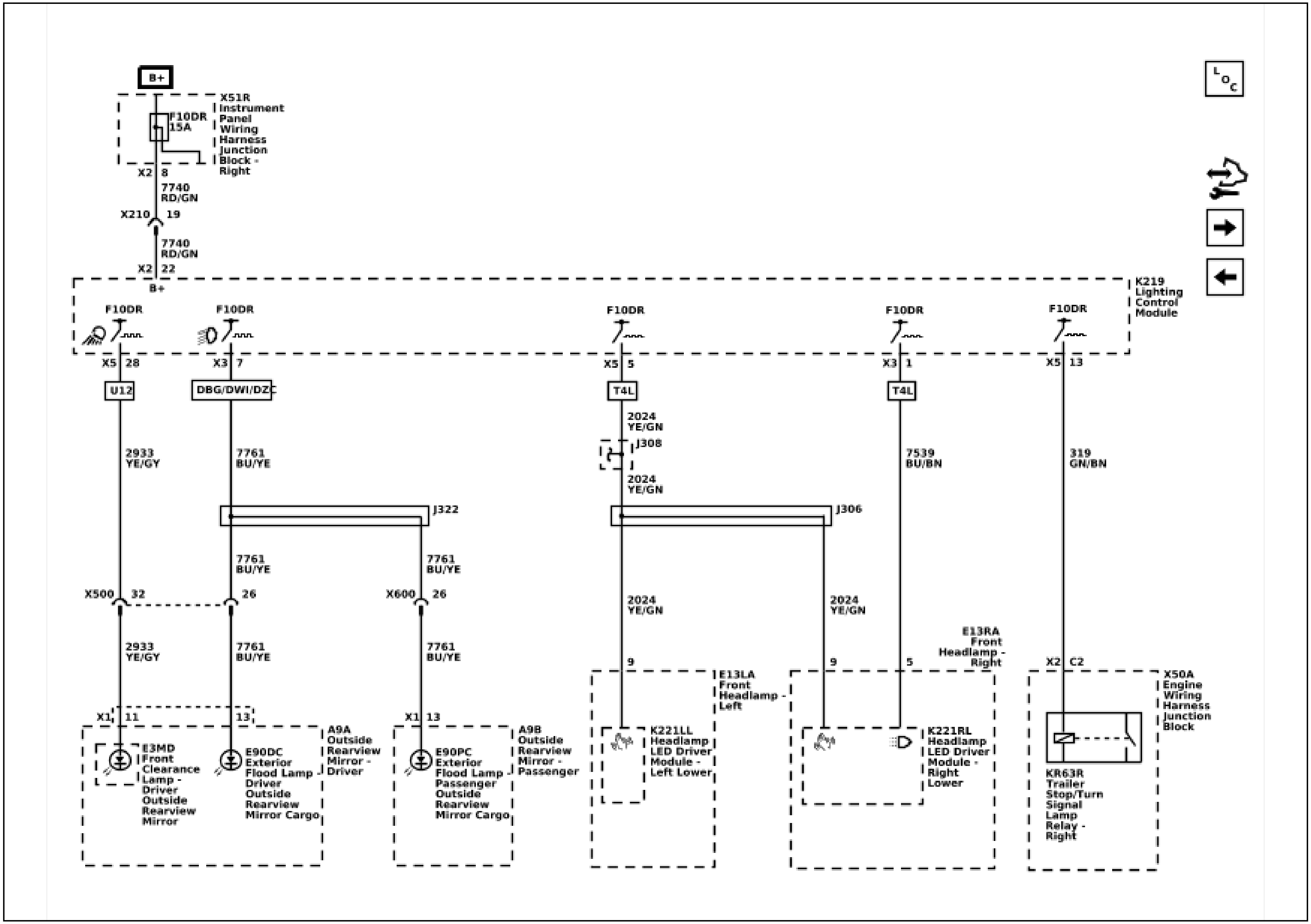

B+
F5DR
10A
X51R
Instrument
Panel
Wiring
Harness
Junction
Block -
Right
X2 33
7140
RD/VT
X210 53
7140
RD/VT
X1 9
B+
K219
Lighting
Control
Module
F5DR
F5DR
F5DR
F5DR
X1 7
6
X5 25
25
6846
GN/YE
X410 52
6846
GN/YE
X950 15
6846
GN/YE
ZW9
E63
J908
6846
GN/YE
6846
GN/YE
6846
GN/YE
1
E7
Rear
License
Plate
Lamp
1
E7L
Rear
License
Plate
Lamp -
Left
1
E7R
Rear
License
Plate
Lamp -
Right
5061
BN/GY
T3U
X150 10
5061
BN/GY
J126
5061
BN/GY
5062
BN/GN
2
E29LF
Front Fog
Lamp -
Left
2
E29RF
Front
Fog
Lamp -
Right
820
BN/YE
UET
-UET
J303
820
BN/YE
X410 3
820
BN/YE
11
K68
Trailer
Lamp
Control
Module
820
BN/YE
X210 57
820
BN/YE
X370B 17
X370A 33
820
BN/YE
X371A 2
X371A_UVO 2
820
BN/YE
2
E6A
High
Mount
Stop and
Cargo
Lamp
820
BN/YE
X2 F2
KR41
High Mount Stop
Lamp Relay
X50A
Engine
Wiring
Harness
Junction
Block

6846369

Power Distribution Schematics (Lighting Control Module High Side Drives - F5DR Fuse - 2 of 2)

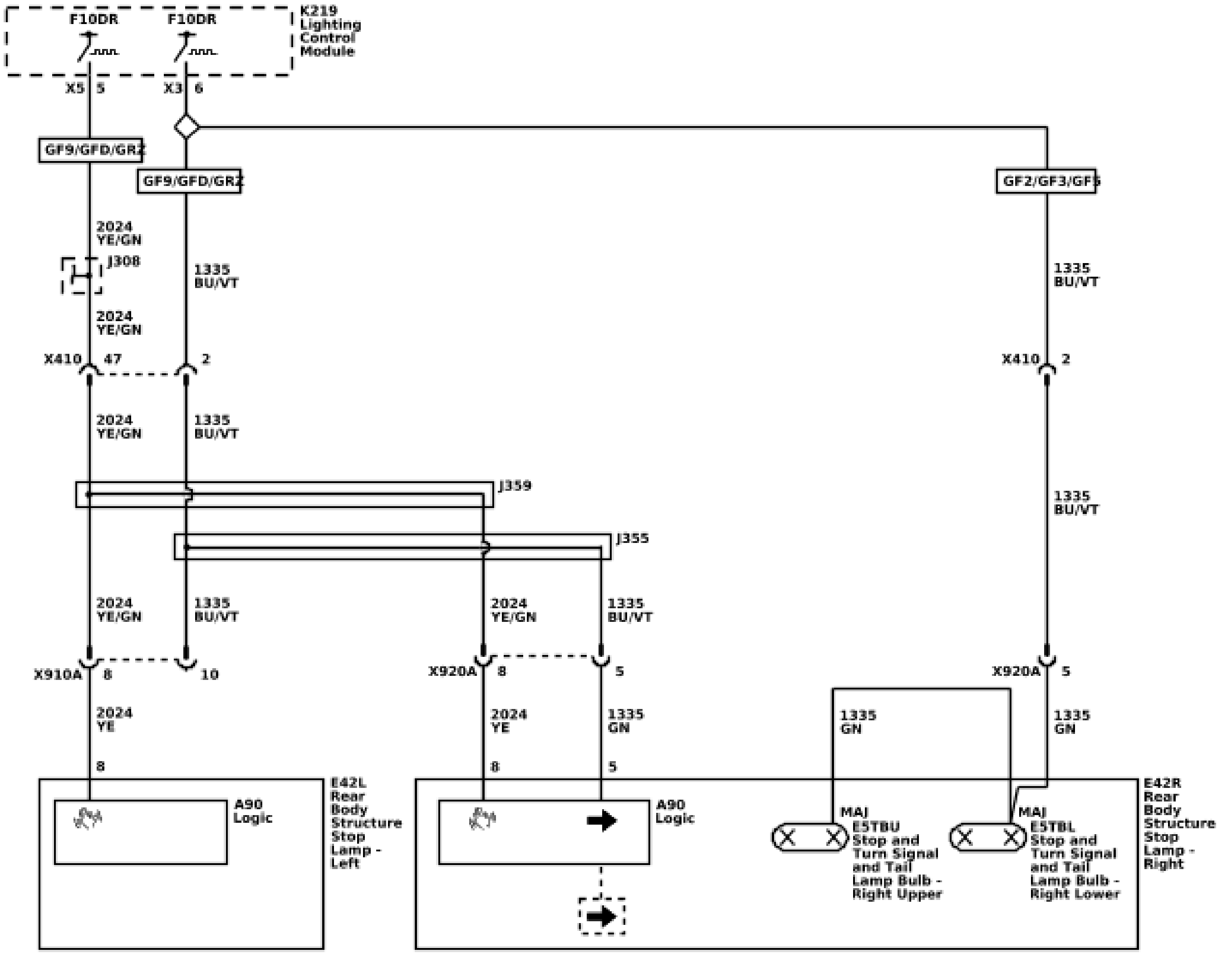

6846370
K219 Lighting Control Module
F5DR
X1 1
X5 2
5
T4A
T4L
ZW9
GF9/GFD/GR2
GF2/GF3/GF5
1254 WH/YE
1314 BU/WH
6995 BN/GY
6995 GY
6995 BN
X410 54
X920A 1
X920A 4
1
6
7
10
J180
J307
E2LF Front Side Marker Lamp - Left
E4NB Parking and Turn Signal Lamp Bulb - Left
K221LL Headlamp LED Driver Module - Left Lower
K221RL Headlamp LED Driver Module - Right Lower
E13LA Front Headlamp - Left
E13RA Front Headlamp - Right
E5TB Tail/Stop and Turn Signal Lamp Bulb - Right
A90 Logic
E5TBU Stop and Turn Signal and Tail Lamp Bulb - Right Upper
E5TBL Stop and Turn Signal and Tail Lamp Bulb - Right Lower
MIN
E2RRB Side Marker Bulb - Right Rear
E42R Rear Body Structure Stop Lamp - Right

Power Distribution Schematics (Lighting Control Module High Side Drives - F10DR Fuse - 1 of 2)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F10DR 15A
X2 8
7740 RD/GN
X210 19
7740 RD/GN
X2 22
B+
K219 Lighting Control Module
F10DR
F10DR
F10DR
F10DR
F10DR
X5 28
X3 7
X5 5
X3 1
X5 13
U12
DBG/DWI/DZC
T4L
T4L
2933 YE/GY
7761 BU/YE
2024 YE/GN
J308
2024 YE/GN
7539 BU/BN
319 GN/BN
J322
J306
7761 BU/YE
7761 BU/YE
X500 32
26
X600 26
2024 YE/GN
2024 YE/GN
2933 YE/GY
7761 BU/YE
7761 BU/YE
9
9
5
E13RA Front Headlamp - Right
X2 C2
E13LA Front Headlamp - Left
X50A Engine Wiring Harness Junction Block
X1 11
13
X1 13
A9A Outside Rearview Mirror - Driver
A9B Outside Rearview Mirror - Passenger
E3MD Front Clearance Lamp - Driver Outside Rearview Mirror
E90DC Exterior Flood Lamp - Driver Outside Rearview Mirror Cargo
E90PC Exterior Flood Lamp - Passenger Outside Rearview Mirror Cargo
K221LL Headlamp LED Driver Module - Left Lower
K221RL Headlamp LED Driver Module - Right Lower
KR63R Trailer Stop/Turn Signal Lamp Relay - Right

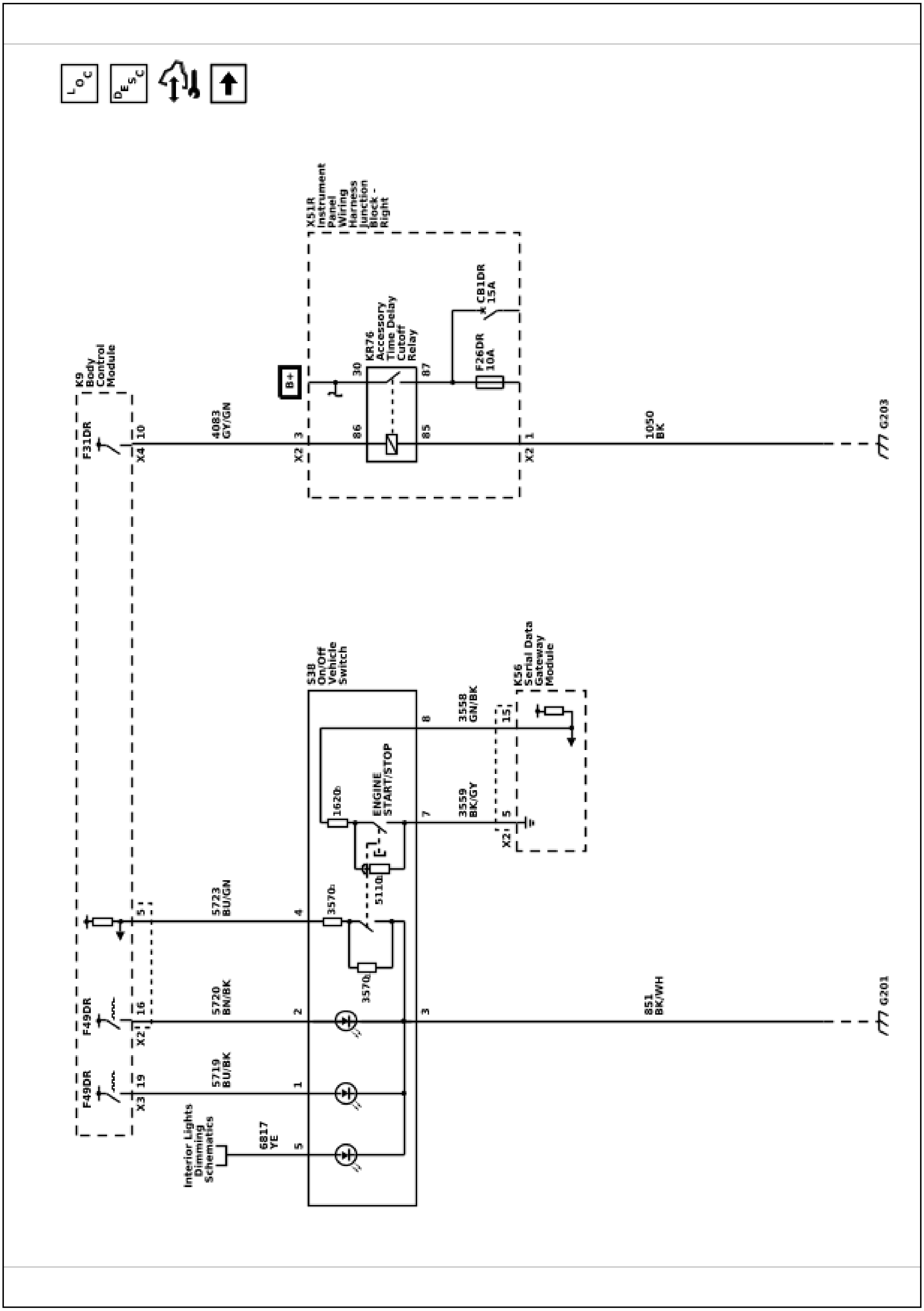
6846371

Power Distribution Schematics (Lighting Control Module High Side Drives - F10DR Fuse - 2 of 2)


F10DR
F10DR
K219 Lighting Control Module
X5 5
X3 6
GF9/GFD/GR2
GF9/GFD/GR2
GF2/GF3/GF5
2024 YE/GN
J308
2024 YE/GN
1335 BU/VT
1335 BU/VT
X410 47
2
X410 2
2024 YE/GN
1335 BU/VT
J359
J355
1335 BU/VT
2024 YE/GN
1335 BU/VT
2024 YE/GN
1335 BU/VT
X910A 8
10
X920A 8
5
X920A 5
2024 YE
2024 YE
1335 GN
1335 GN
1335 GN
8
8
5
A90 Logic
E42L Rear Body Structure Stop Lamp - Left
A90 Logic
MAJ E5TBU Stop and Turn Signal and Tail Lamp Bulb - Right Upper
MAJ E5TBL Stop and Turn Signal and Tail Lamp Bulb - Right Lower
E42R Rear Body Structure Stop Lamp - Right

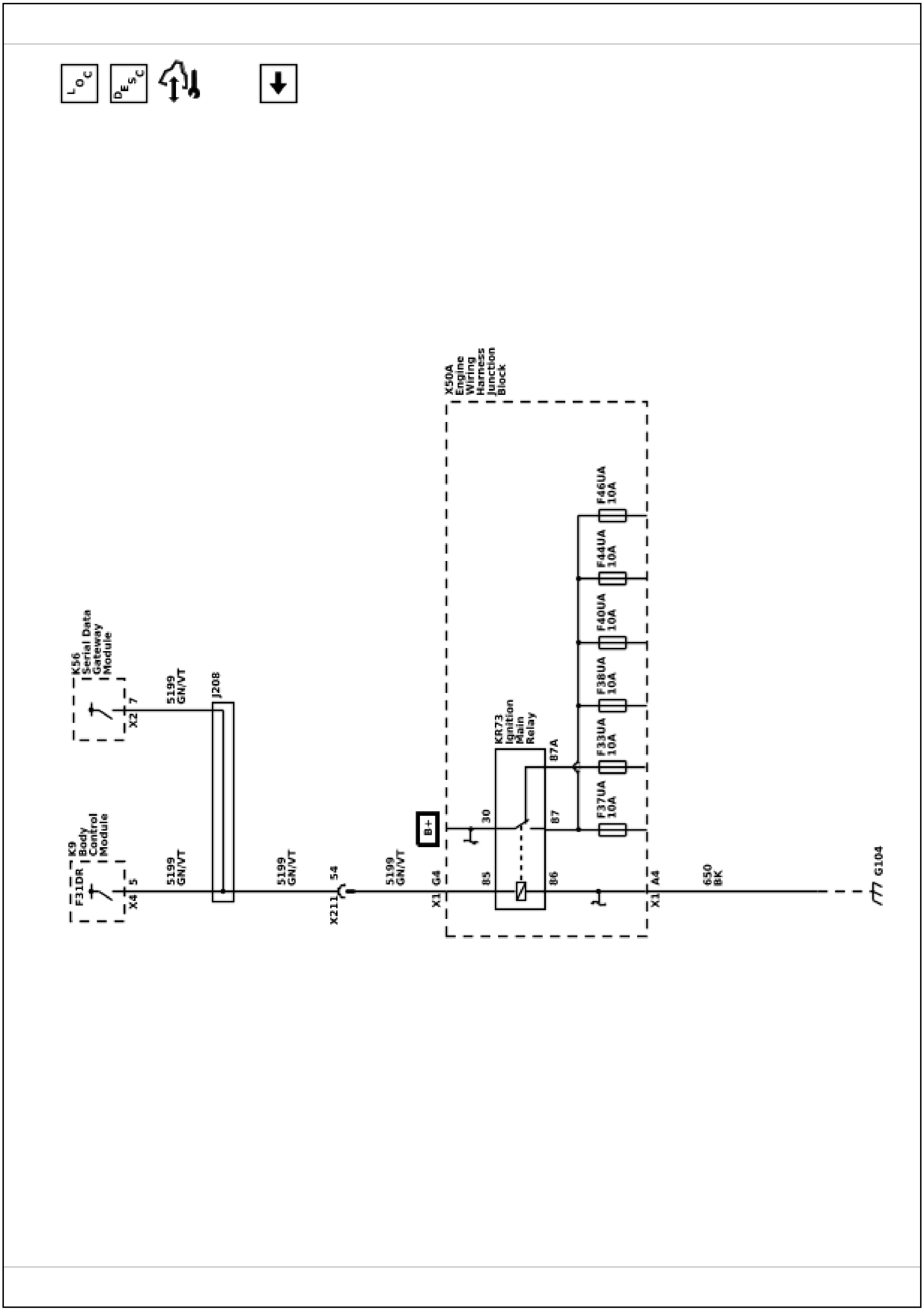
6846372

Power Moding Schematics (On/Off Vehicle Switch and Retained Accessory Power)

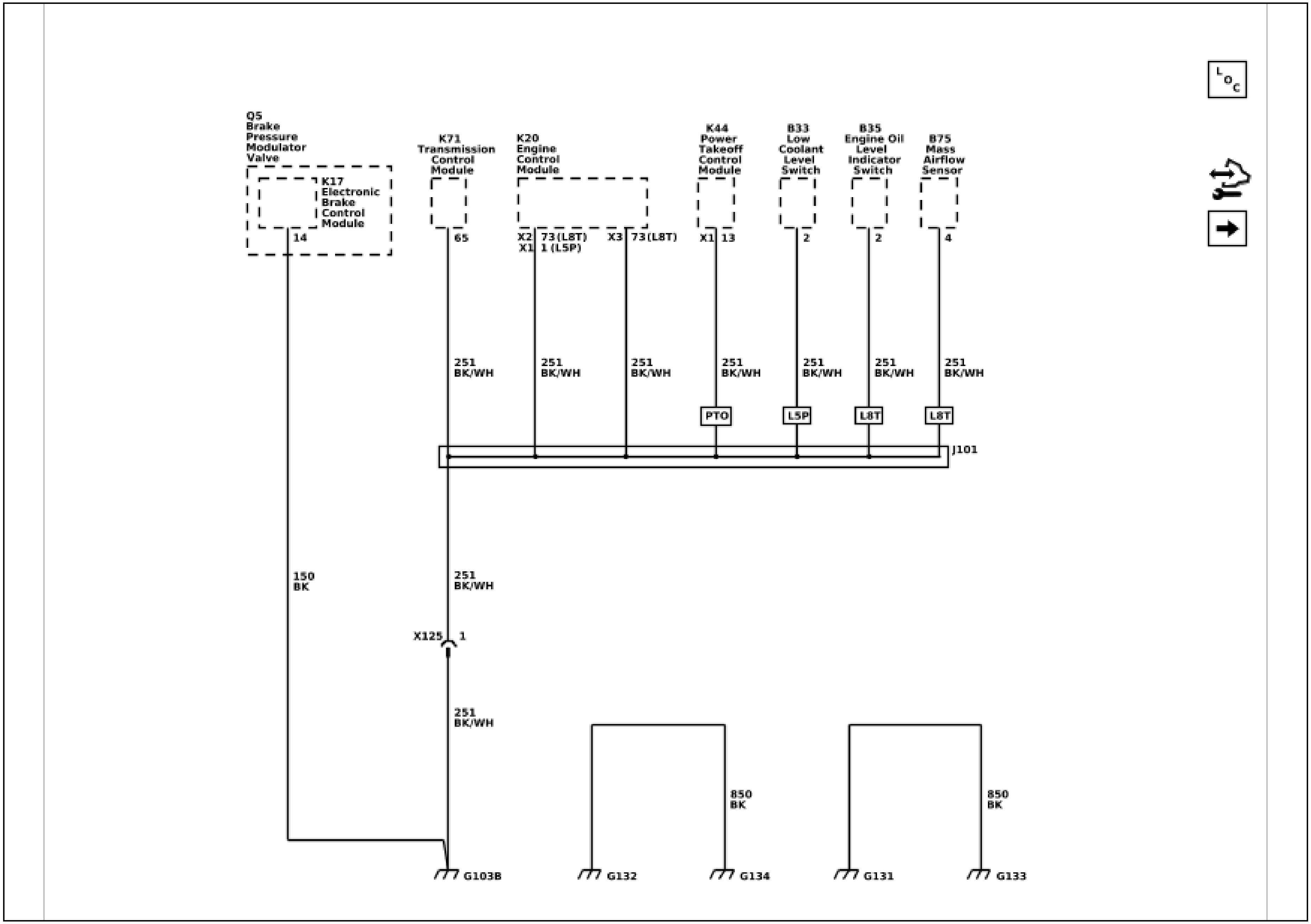

LOC
DESC
K9 Body Control Module
F31DR
X4 10
4083 GY/GN
B+
X51R Instrument Panel Wiring Harness Junction Block - Right
X2 3
30
86
KR76 Accessory Time Delay Cutoff Relay
87
85
F26DR 10A
CB1DR 15A
X2 1
1050 BK
G203
S38 On/Off Vehicle Switch
8
3558 GN/BK
15
K56 Serial Data Gateway Module
1620Ω
ENGINE START/STOP
7
3559 BK/GY
X2 5
5110Ω
5
5723 BU/GN
4
3570Ω
3570Ω
F49DR
X2 16
5720 BN/BK
2
3
851 BK/WH
G201
F49DR
X3 19
5719 BU/BK
1
Interior Lights Dimming Schematics
6817 YE
5

6846373

Power Moding Schematics (Ignition Main Relay)

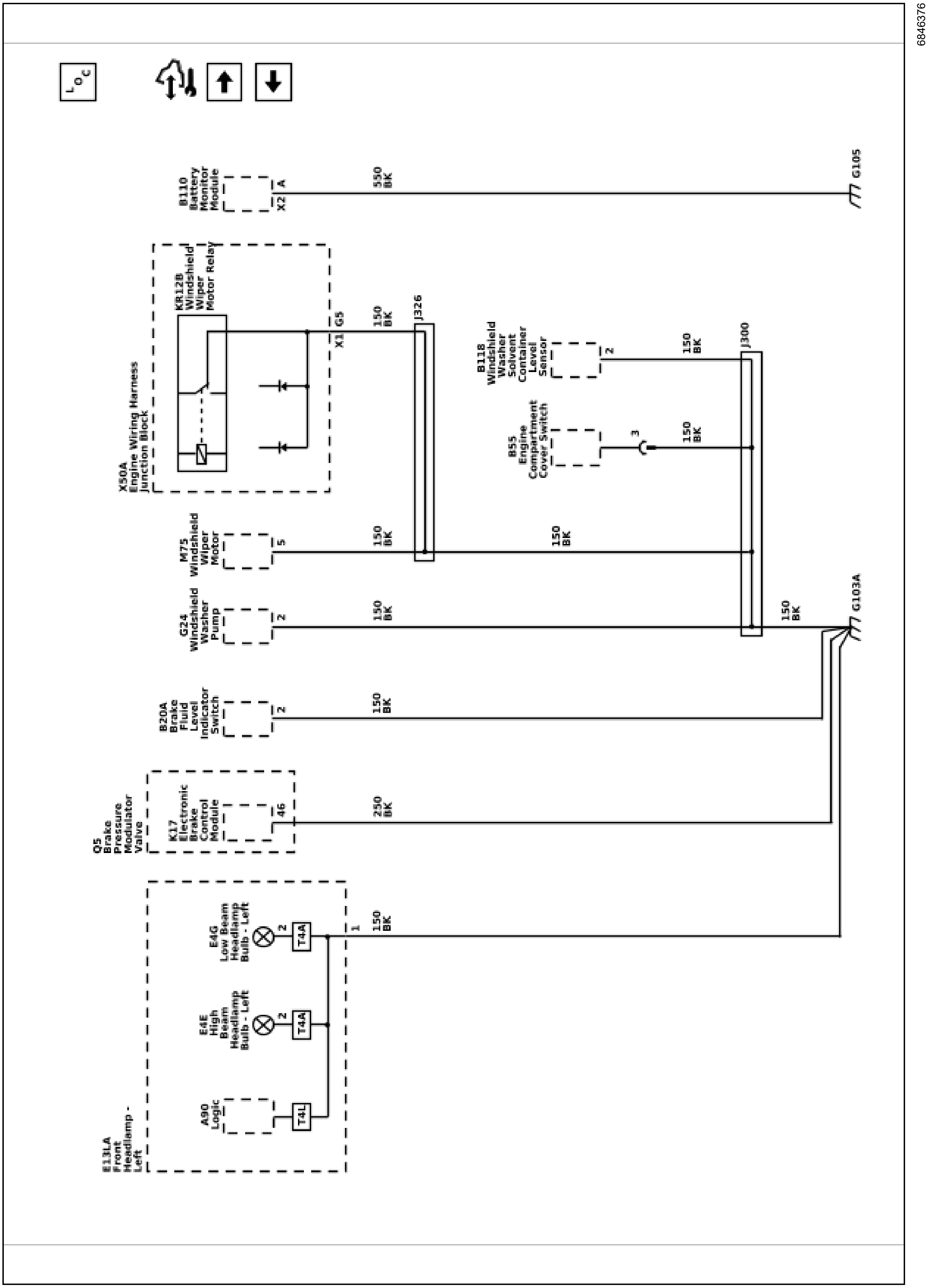

6846374
K9
Body
Control
Module
F31DR
X4 5
5199
GN/VT
K56
Serial Data
Gateway
Module
X2 7
5199
GN/VT
J208
5199
GN/VT
X211 54
5199
GN/VT
X1 G4
B+
30
85
86
87
87A
KR73
Ignition
Main
Relay
X50A
Engine
Wiring
Harness
Junction
Block
F37UA
10A
F33UA
10A
F38UA
10A
F40UA
10A
F44UA
10A
F46UA
10A
X1 A4
650
BK
G104

Ground Distribution Schematics (G103B, G131, G132, G133, and G134)

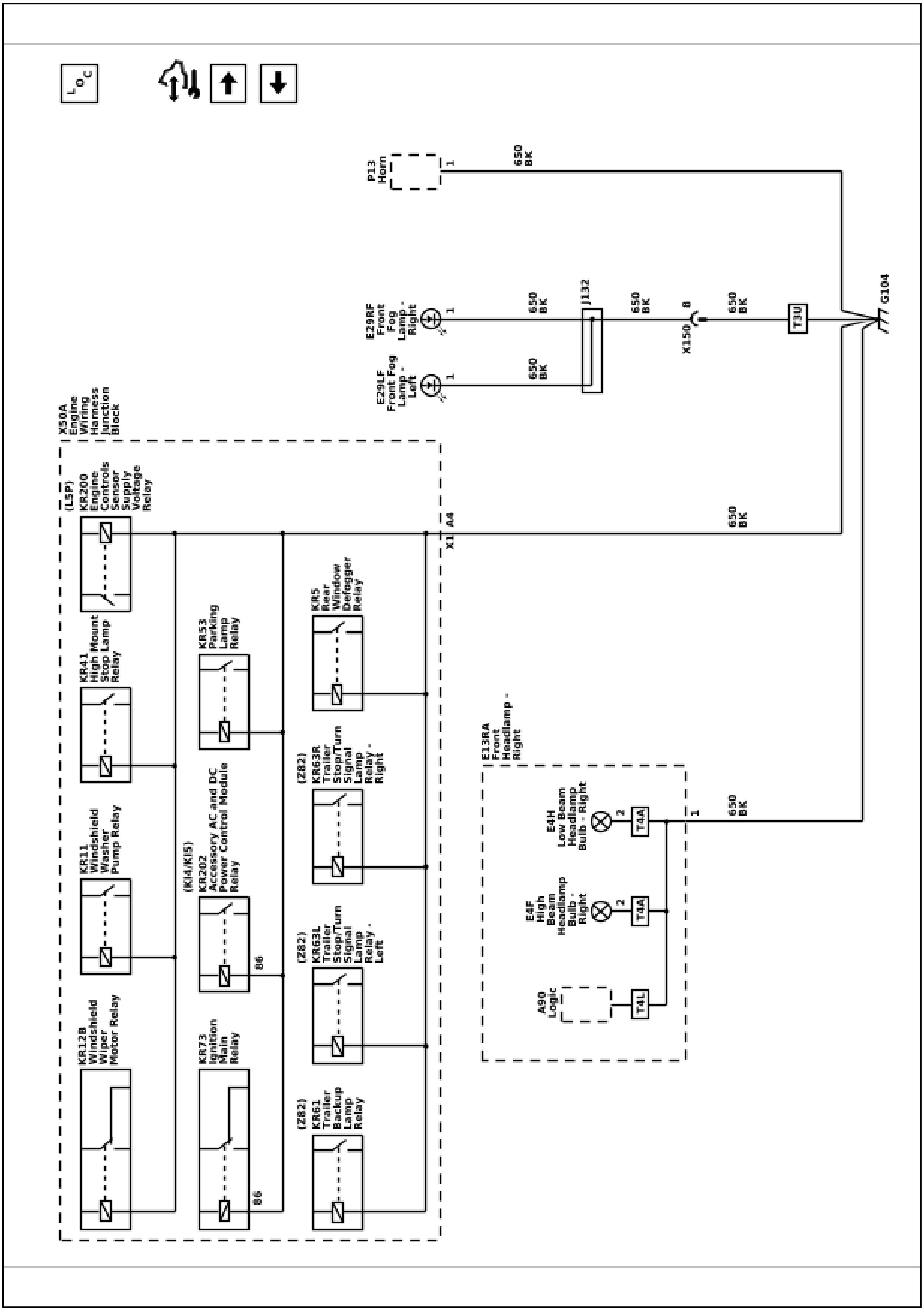

L O C
Q5 Brake Pressure Modulator Valve
K17 Electronic Brake Control Module
14
K71 Transmission Control Module
65
K20 Engine Control Module
X2 73 (L8T)
X1 1 (L5P)
X3 73 (L8T)
K44 Power Takeoff Control Module
X1 13
B33 Low Coolant Level Switch
2
B35 Engine Oil Level Indicator Switch
2
B75 Mass Airflow Sensor
4
251 BK/WH
PTO
L5P
L8T
L8T
J101
150 BK
X125 1
850 BK
850 BK
G103B
G132
G134
G131
G133

6846375

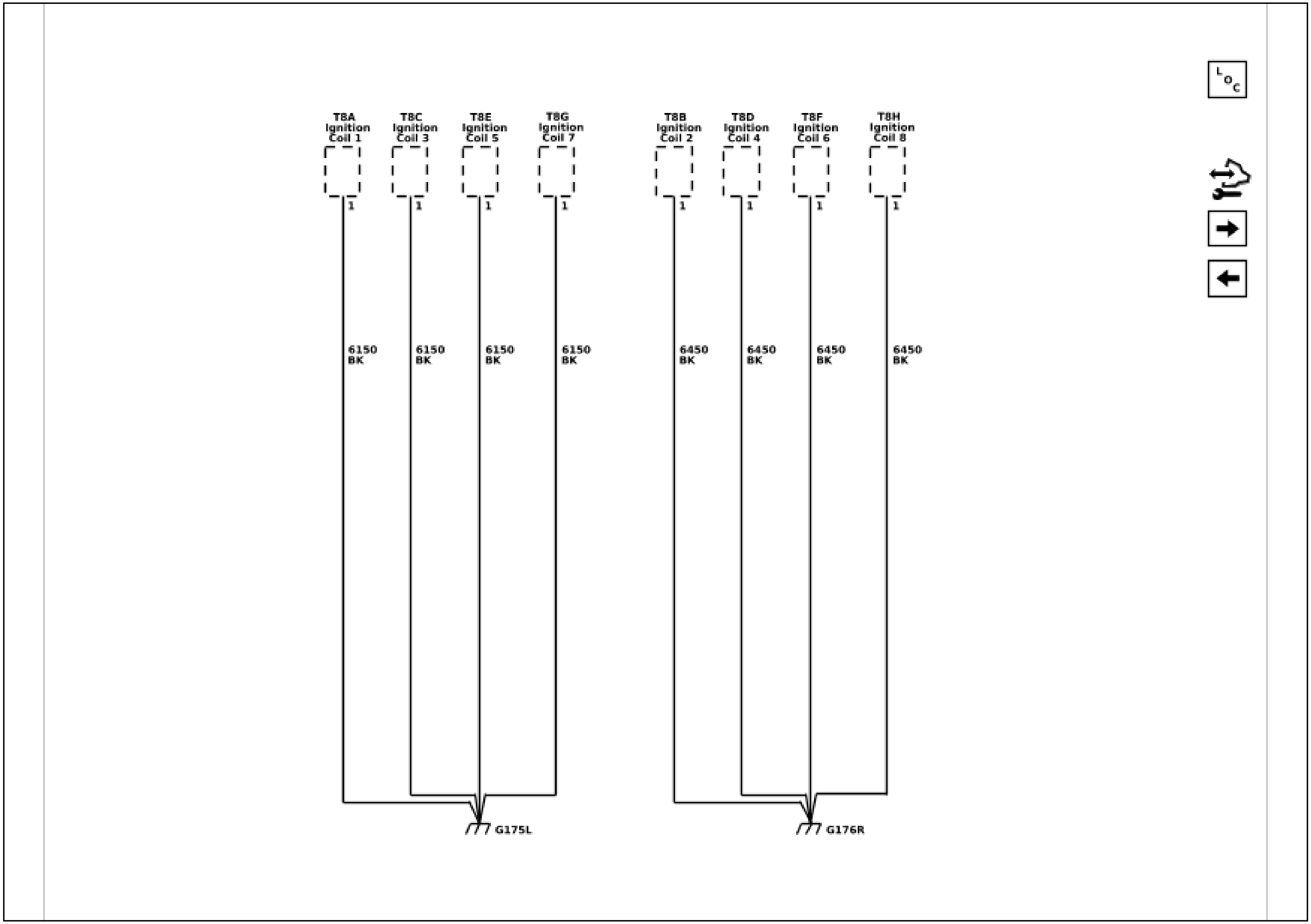
Ground Distribution Schematics (G103A and G105)


6846376
B110 Battery Monitor Module
X2 A
550 BK
G105
X50A Engine Wiring Harness Junction Block
KR12B Windshield Wiper Motor Relay
X1 G5
150 BK
J326
B118 Windshield Washer Solvent Container Level Sensor
2
150 BK
J300
B55 Engine Compartment Cover Switch
3
150 BK
M75 Windshield Wiper Motor
5
150 BK
150 BK
G24 Windshield Washer Pump
2
150 BK
150 BK
G103A
B20A Brake Fluid Level Indicator Switch
2
150 BK
Q5 Brake Pressure Modulator Valve
K17 Electronic Brake Control Module
46
250 BK
E13LA Front Headlamp - Left
E4G Low Beam Headlamp Bulb - Left
2
T4A
1
150 BK
E4E High Beam Headlamp Bulb - Left
2
T4A
A90 Logic
T4L

Ground Distribution Schematics (G104)


6846377
X50A Engine Wiring Harness Junction Block
(L5P) KR200 Engine Controls Sensor Supply Voltage Relay
KR41 High Mount Stop Lamp Relay
KR11 Windshield Washer Pump Relay
KR12B Windshield Wiper Motor Relay
KR53 Parking Lamp Relay
(KI4/KI5) KR202 Accessory AC and DC Power Control Module Relay
86
KR73 Ignition Main Relay
86
KR5 Rear Window Defogger Relay
(Z82) KR63R Trailer Stop/Turn Signal Lamp Relay - Right
(Z82) KR63L Trailer Stop/Turn Signal Lamp Relay - Left
(Z82) KR61 Trailer Backup Lamp Relay
X1 A4
650 BK
P13 Horn
1
650 BK
E29RF Front Fog Lamp - Right
1
650 BK
E29LF Front Fog Lamp - Left
1
650 BK
J132
650 BK
X150 8
650 BK
T3U
G104
E13RA Front Headlamp - Right
E4H Low Beam Headlamp Bulb - Right
2
T4A
E4F High Beam Headlamp Bulb - Right
2
T4A
A90 Logic
T4L
1
650 BK

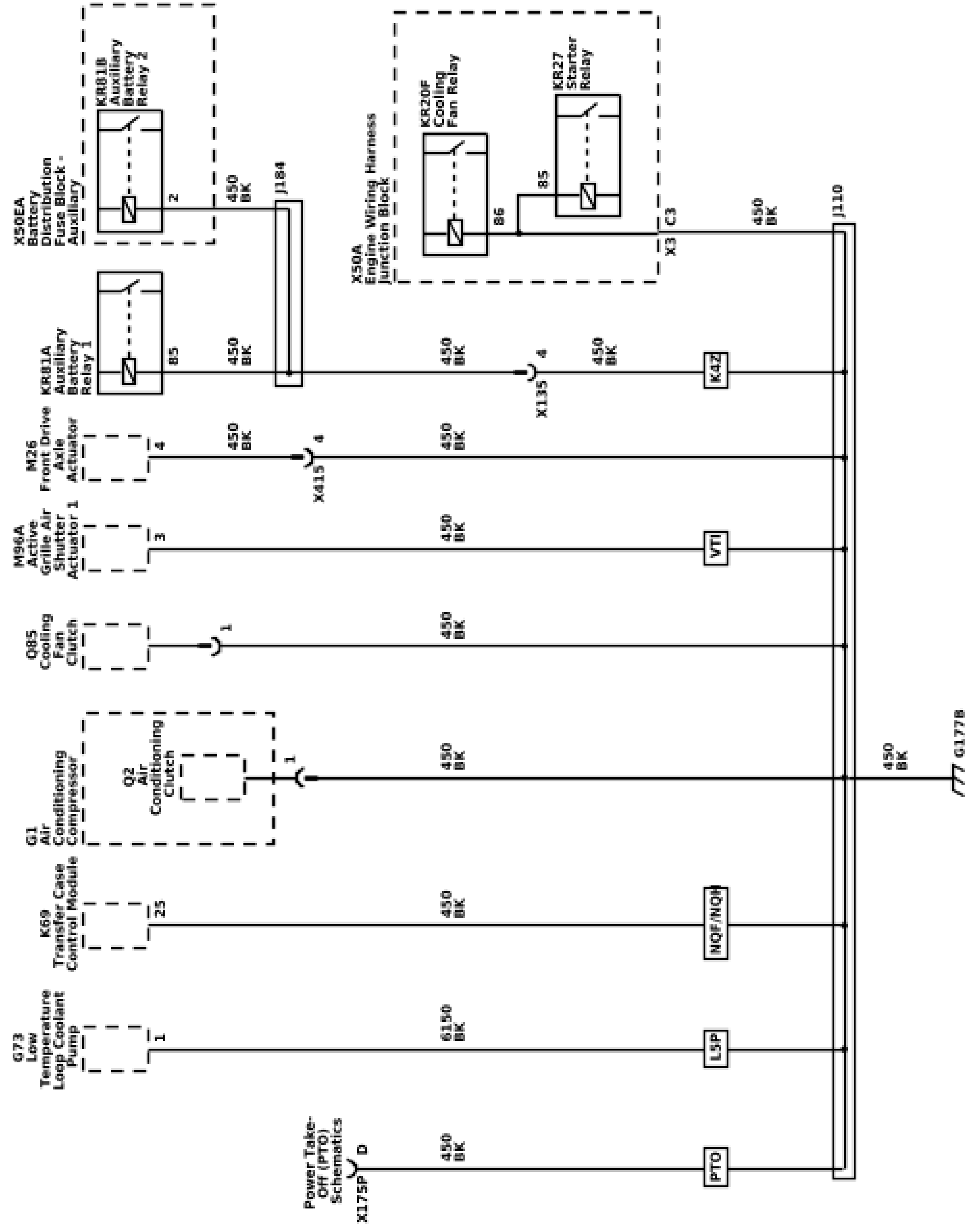
Ground Distribution Schematics (G175L and G175R (L8T))


T8A
Ignition
Coil 1
T8C
Ignition
Coil 3
T8E
Ignition
Coil 5
T8G
Ignition
Coil 7
T8B
Ignition
Coil 2
T8D
Ignition
Coil 4
T8F
Ignition
Coil 6
T8H
Ignition
Coil 8
1
6150
BK
6450
BK
G175L
G176R
L O C

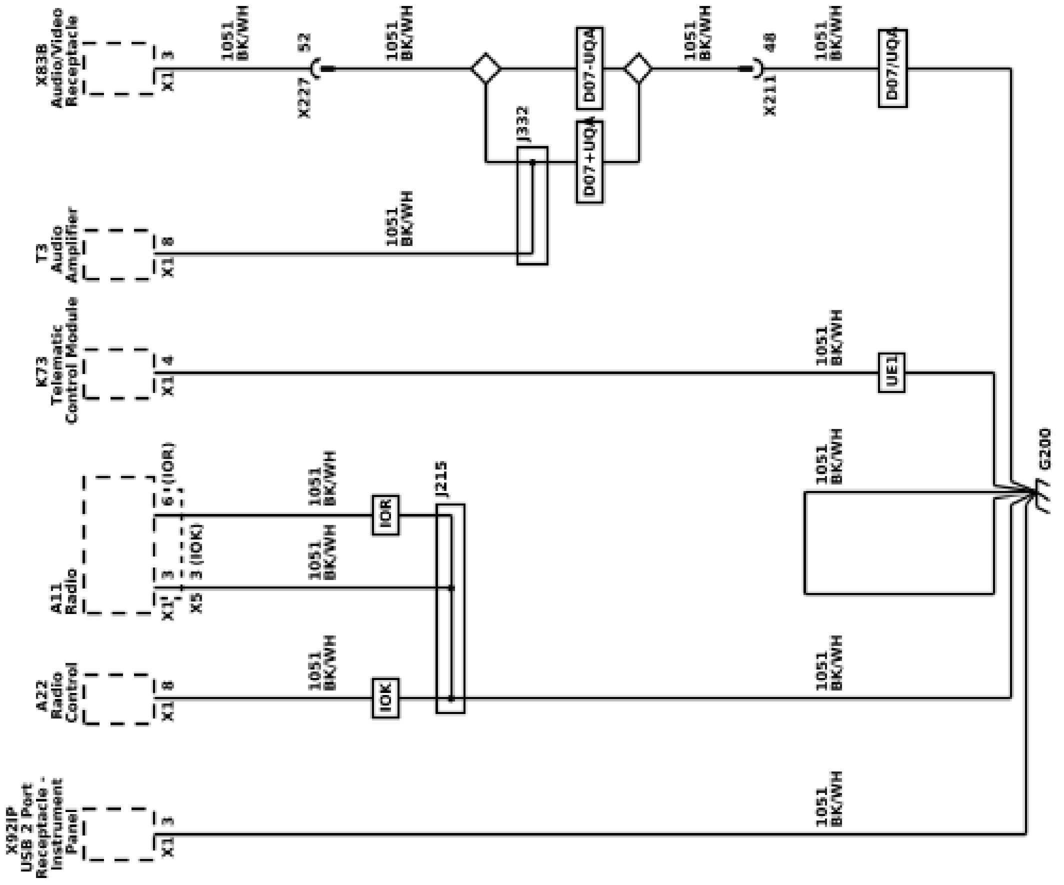
6846378

Ground Distribution Schematics (G177B)

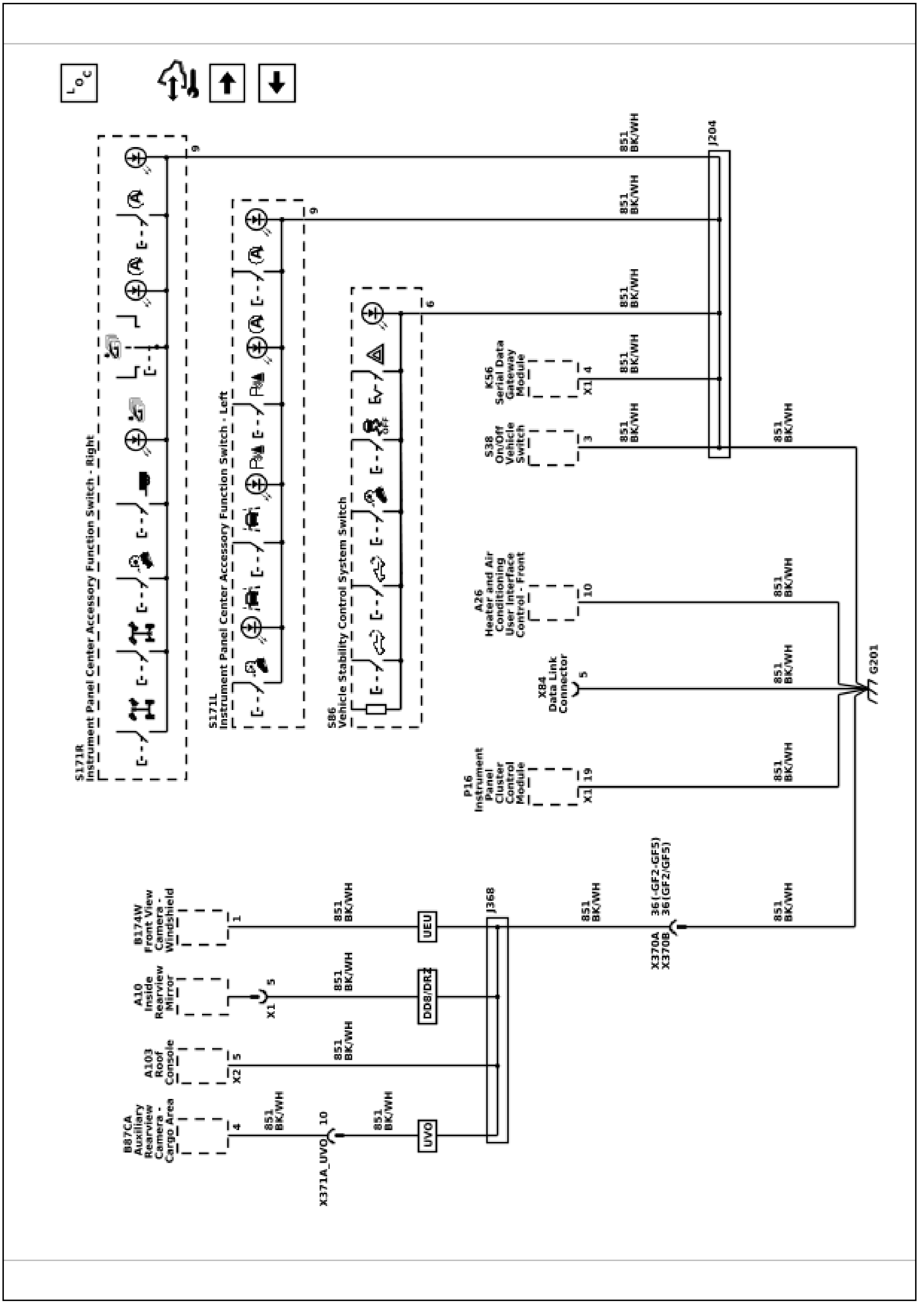
6846379


X50EA Battery Distribution Fuse Block - Auxiliary
KR81B Auxiliary Battery Relay 2
2
450 BK
J184
KR81A Auxiliary Battery Relay 1
85
450 BK
450 BK
X135 4
450 BK
K4Z
X50A Engine Wiring Harness Junction Block
KR20F Cooling Fan Relay
86
KR27 Starter Relay
85
X3 C3
450 BK
J110
M26 Front Drive Axle Actuator
4
450 BK
X415 4
450 BK
M96A Active Grille Air Shutter Actuator 1
3
450 BK
VTI
Q85 Cooling Fan Clutch
1
450 BK
G1 Air Conditioning Compressor
Q2 Air Conditioning Clutch
1
450 BK
450 BK
G177B
K69 Transfer Case Control Module
25
450 BK
NQF/NQH
G73 Low Temperature Loop Coolant Pump
1
6150 BK
L5P
Power Take-Off (PTO) Schematics
X175P D
450 BK
PTO

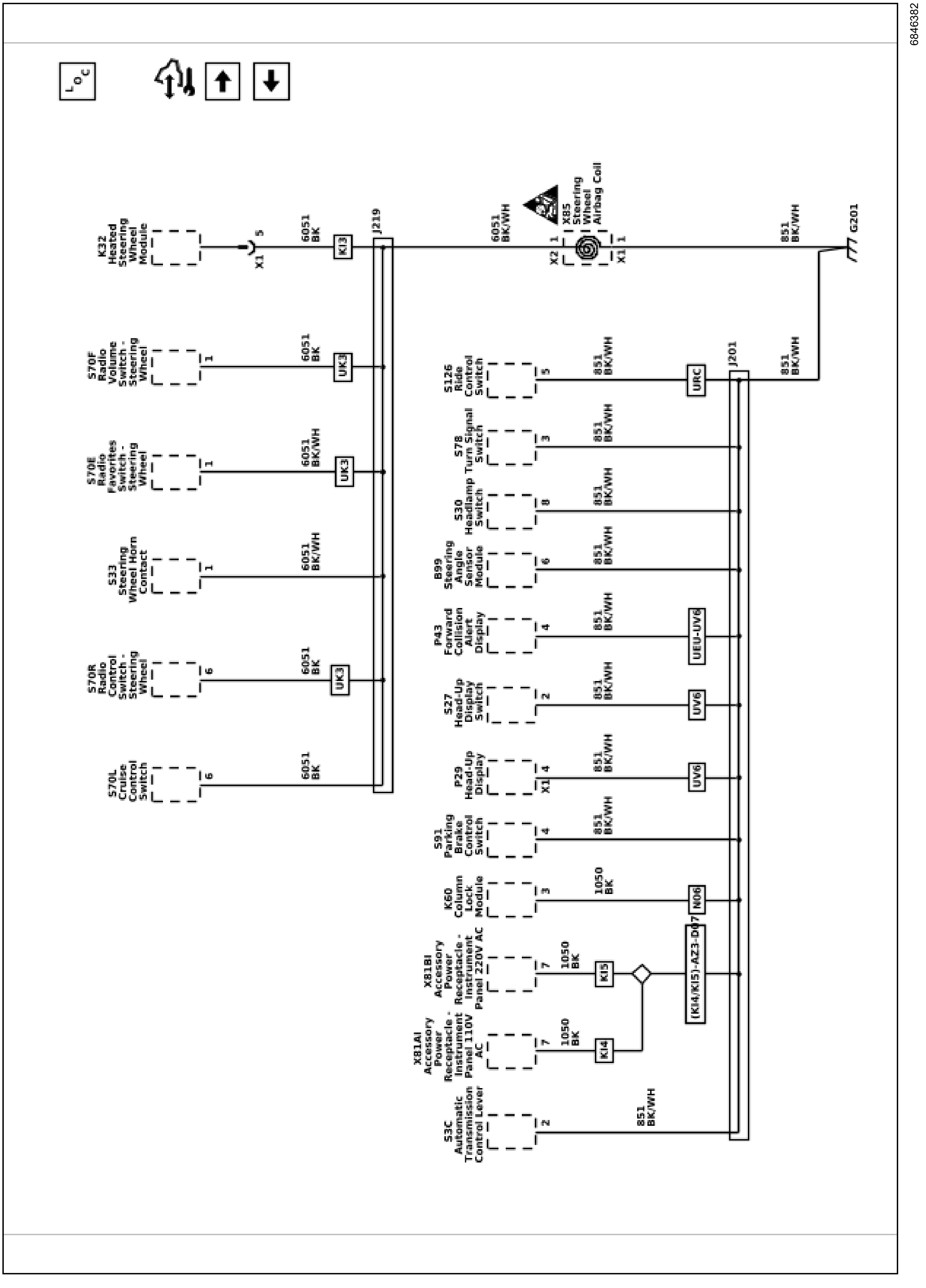
Ground Distribution Schematics (G200)


6846380
X83B Audio/Video Receptacle
X1 3
1051 BK/WH
52
X227
1051 BK/WH
D07-UQA
D07+UQA
J332
1051 BK/WH
48
X211
1051 BK/WH
D07/UQA
T3 Audio Amplifier
X1 8
1051 BK/WH
K73 Telematic Control Module
X1 4
1051 BK/WH
UE1
A11 Radio
X1 6 (IOR)
X1 3
X5 3 (IOK)
1051 BK/WH
IOR
1051 BK/WH
J215
1051 BK/WH
G200
A22 Radio Control
X1 8
1051 BK/WH
IOK
1051 BK/WH
X92IP USB 2 Port Receptacle - Instrument Panel
X1 3
1051 BK/WH

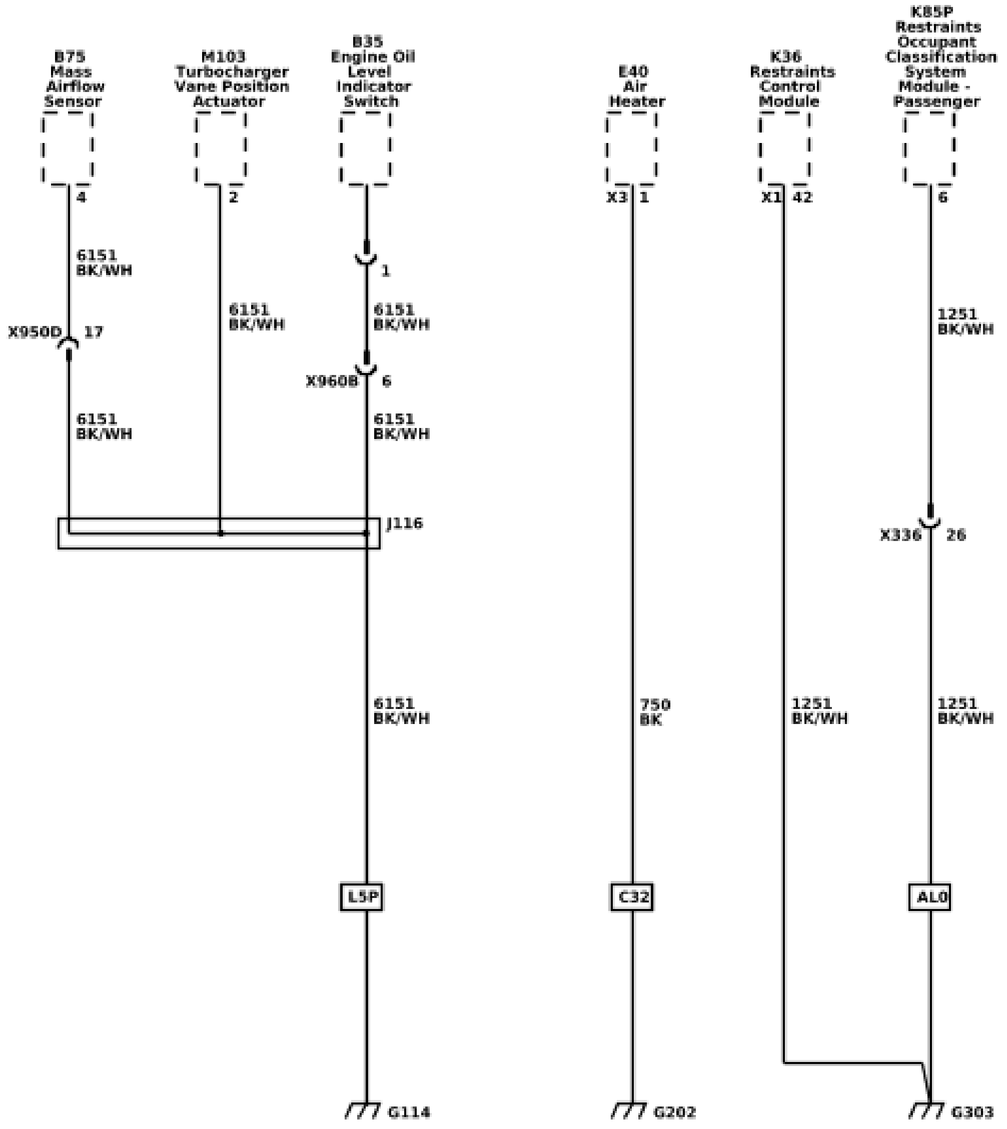
Ground Distribution Schematics (G201 - 1 of 2)


6846381
S171R
Instrument Panel Center Accessory Function Switch - Right
S171L
Instrument Panel Center Accessory Function Switch - Left
S86
Vehicle Stability Control System Switch
9
9
6
OFF
J204
851 BK/WH
K56
Serial Data
Gateway
Module
X1 4
S38
On/Off
Vehicle
Switch
3
A26
Heater and Air
Conditioning
User Interface
Control - Front
10
X84
Data Link
Connector
5
G201
P16
Instrument
Panel
Cluster
Control
Module
X1 19
B174W
Front View
Camera -
Windshield
1
A10
Inside
Rearview
Mirror
X1 5
A103
Roof
Console
X2 5
B87CA
Auxiliary
Rearview
Camera -
Cargo Area
4
X371A_UVO 10
UEU
DD8/DR2
UVO
J368
X370A 36(-GF2-GF5)
X370B 36(GF2/GF5)

Ground Distribution Schematics (G201 - 2 of 2)

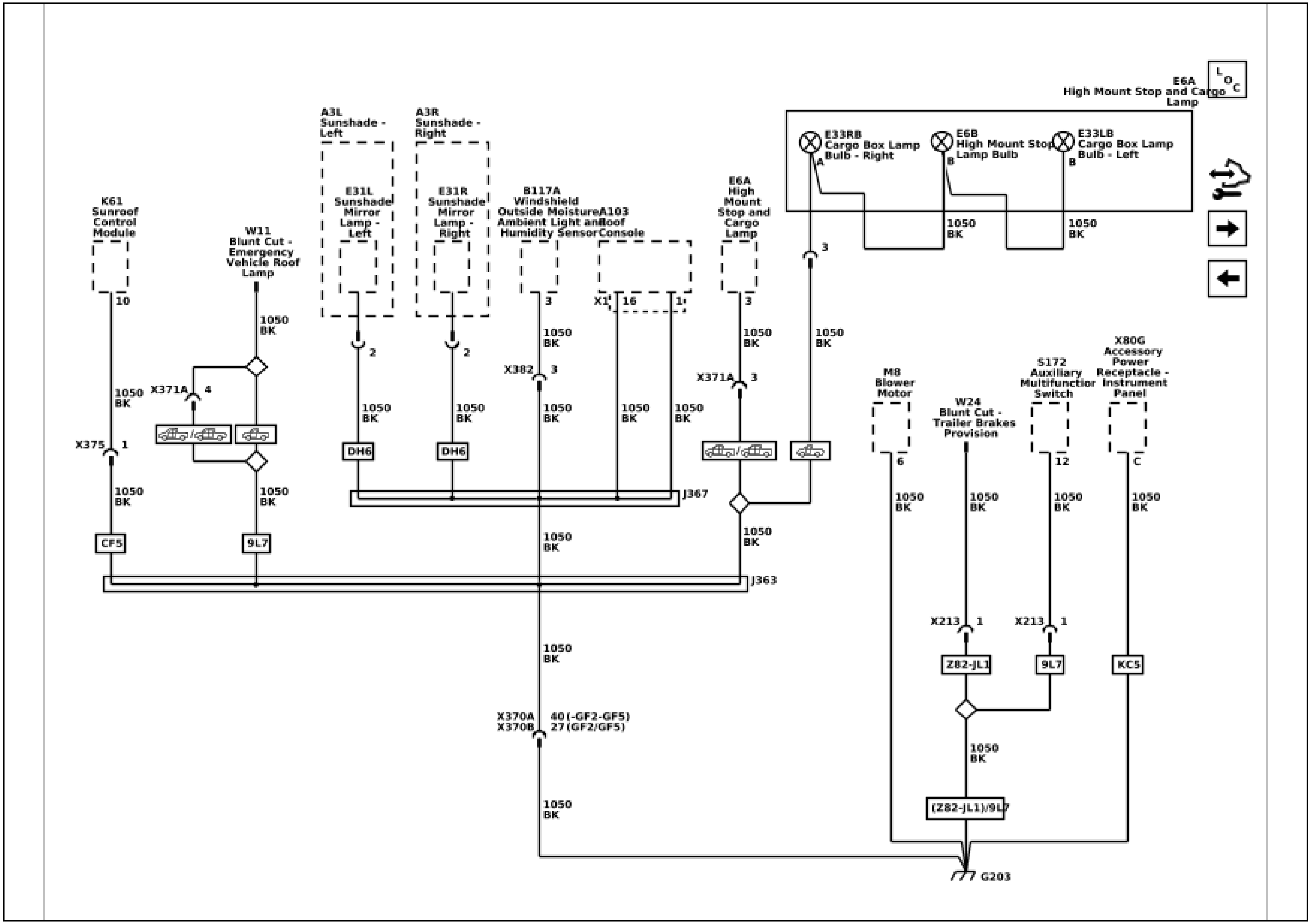

6846382
K32 Heated Steering Wheel Module
X1 5
6051 BK
KI3
J219
6051 BK/WH
X2 1
X85 Steering Wheel Airbag Coil
X1 1
851 BK/WH
G201
S70F Radio Volume Switch - Steering Wheel
1
6051 BK
UK3
S70E Radio Favorites Switch - Steering Wheel
1
6051 BK/WH
UK3
S33 Steering Wheel Horn Contact
1
6051 BK/WH
S70R Radio Control Switch - Steering Wheel
6
6051 BK
UK3
S70L Cruise Control Switch
6
6051 BK
S126 Ride Control Switch
5
851 BK/WH
URC
J201
851 BK/WH
S78 Turn Signal Switch
3
851 BK/WH
S30 Headlamp Switch
8
851 BK/WH
B99 Steering Angle Sensor Module
6
851 BK/WH
P43 Forward Collision Alert Display
4
851 BK/WH
UEU-UV6
S27 Head-Up Display Switch
2
851 BK/WH
UV6
P29 Head-Up Display
X1 4
851 BK/WH
UV6
S91 Parking Brake Control Switch
4
851 BK/WH
K60 Column Lock Module
3
1050 BK
N06
X81BI Accessory Power Receptacle - Instrument Panel 220V AC
7
1050 BK
KI5
(KI4/KI5)-AZ3-D07
X81AI Accessory Power Receptacle - Instrument Panel 110V AC
7
1050 BK
KI4
S3C Automatic Transmission Control Lever
2
851 BK/WH

Ground Distribution Schematics (G202, G303, and G114)


B75
Mass
Airflow
Sensor
4
6151
BK/WH
X950D
17
6151
BK/WH
M103
Turbocharger
Vane Position
Actuator
2
6151
BK/WH
B35
Engine Oil
Level
Indicator
Switch
1
6151
BK/WH
X960B
6
6151
BK/WH
J116
6151
BK/WH
L5P
G114
E40
Air
Heater
X3
1
750
BK
C32
G202
K36
Restraints
Control
Module
X1
42
1251
BK/WH
K85P
Restraints
Occupant
Classification
System
Module -
Passenger
6
1251
BK/WH
X336
26
1251
BK/WH
AL0
G303

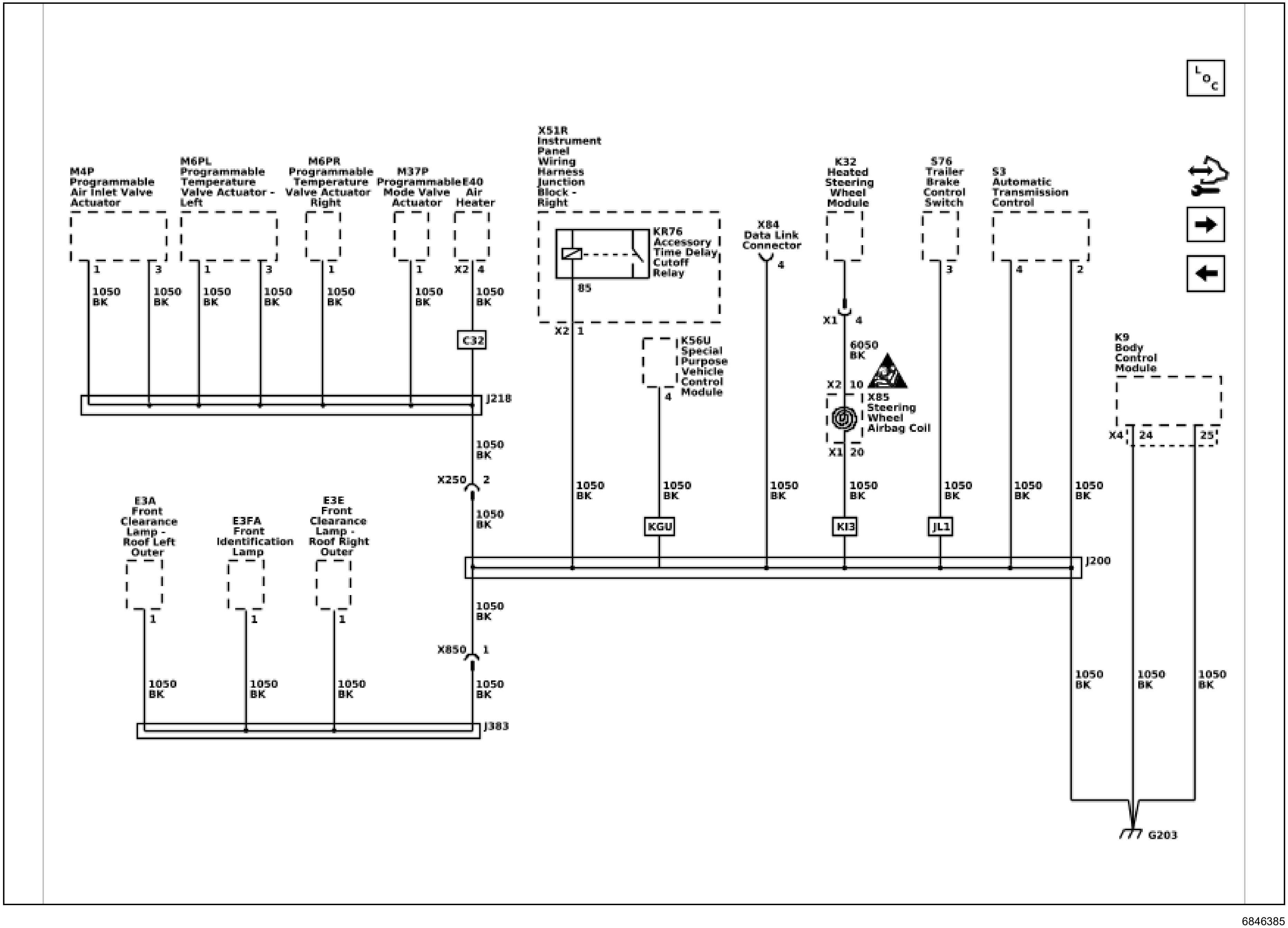
6846383

Ground Distribution Schematics (G203 - 1 of 2)

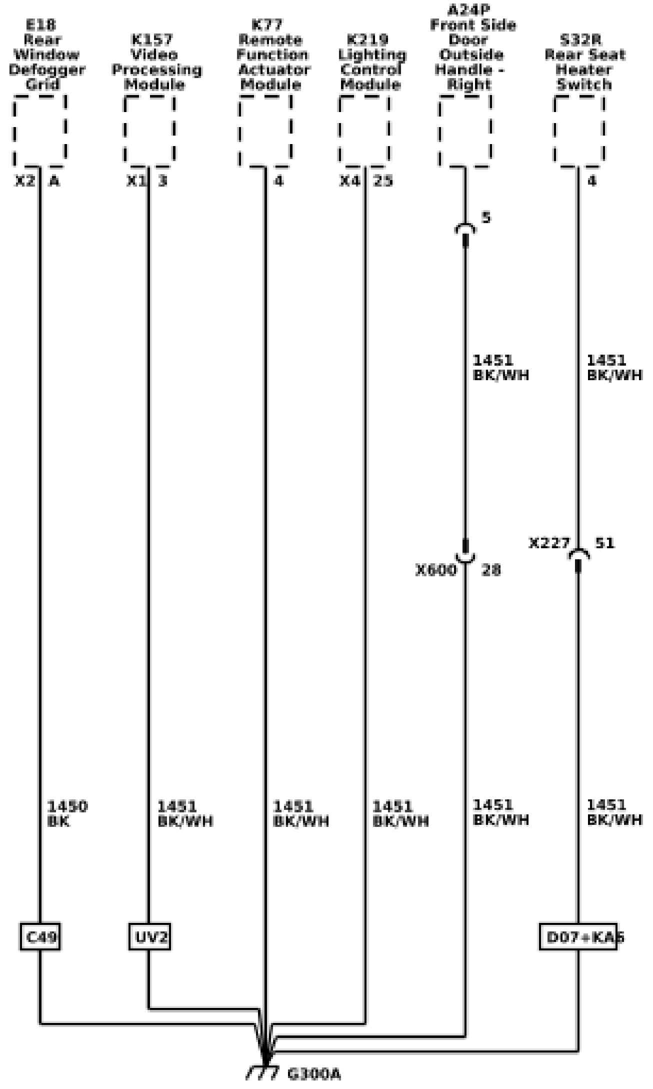

E6A
High Mount Stop and Cargo Lamp
L O C
E33RB
Cargo Box Lamp Bulb - Right
A
E6B
High Mount Stop Lamp Bulb
B
E33LB
Cargo Box Lamp Bulb - Left
B
1050
BK
1050
BK
3
1050
BK
K61
Sunroof Control Module
10
1050
BK
X375
1
1050
BK
CF5
W11
Blunt Cut - Emergency Vehicle Roof Lamp
1050
BK
X371A
4
1050
BK
9L7
A3L
Sunshade - Left
E31L
Sunshade Mirror Lamp - Left
2
1050
BK
DH6
A3R
Sunshade - Right
E31R
Sunshade Mirror Lamp - Right
2
1050
BK
DH6
B117A
Windshield Outside Moisture Ambient Light and Humidity Sensor
3
1050
BK
X382
3
1050
BK
A103
Roof Console
X1
16
1
1050
BK
1050
BK
J367
E6A
High Mount Stop and Cargo Lamp
3
1050
BK
X371A
3
1050
BK
J363
1050
BK
X370A
X370B
40 (-GF2-GF5)
27 (GF2/GF5)
1050
BK
M8
Blower Motor
6
1050
BK
W24
Blunt Cut - Trailer Brakes Provision
1050
BK
X213
1
Z82-JL1
S172
Auxiliary Multifunction Switch
12
1050
BK
X213
1
9L7
X80G
Accessory Power Receptacle - Instrument Panel
C
1050
BK
KC5
1050
BK
(Z82-JL1)/9L7
G203

6846384

Ground Distribution Schematics (G203 - 2 of 2)

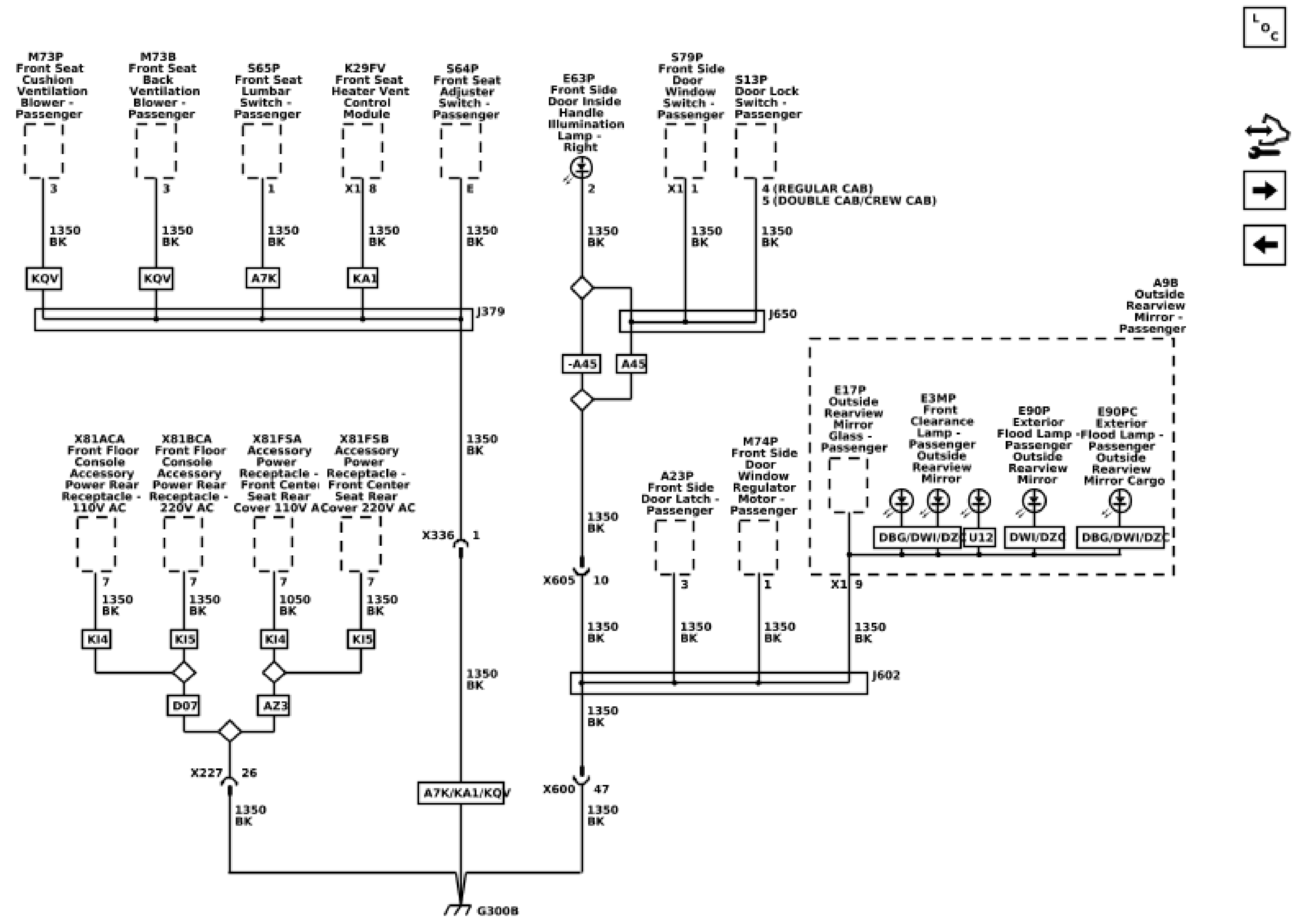

M4P Programmable Air Inlet Valve Actuator
M6PL Programmable Temperature Valve Actuator - Left
M6PR Programmable Temperature Valve Actuator Right
M37P Programmable Mode Valve Actuator
E40 Air Heater
X51R Instrument Panel Wiring Harness Junction Block - Right
KR76 Accessory Time Delay Cutoff Relay
85
X2 1
K56U Special Purpose Vehicle Control Module
4
X84 Data Link Connector
4
K32 Heated Steering Wheel Module
X1 4
6050 BK
X2 10
X85 Steering Wheel Airbag Coil
X1 20
S76 Trailer Brake Control Switch
3
S3 Automatic Transmission Control
4
2
K9 Body Control Module
X4 24
25
1
3
1
3
1
1
X2 4
1050 BK
C32
J218
X250 2
X850 1
J200
J383
KGU
KI3
JL1
E3A Front Clearance Lamp - Roof Left Outer
E3FA Front Identification Lamp
E3E Front Clearance Lamp - Roof Right Outer
1
G203
6846385

Ground Distribution Schematics (G300A)


E18 Rear Window Defogger Grid
K157 Video Processing Module
K77 Remote Function Actuator Module
K219 Lighting Control Module
A24P Front Side Door Outside Handle - Right
S32R Rear Seat Heater Switch
X2 A
X1 3
4
X4 25
4
5
1451 BK/WH
1451 BK/WH
X600 28
X227 51
1450 BK
1451 BK/WH
1451 BK/WH
1451 BK/WH
1451 BK/WH
1451 BK/WH
C49
UV2
D07+KA6
G300A

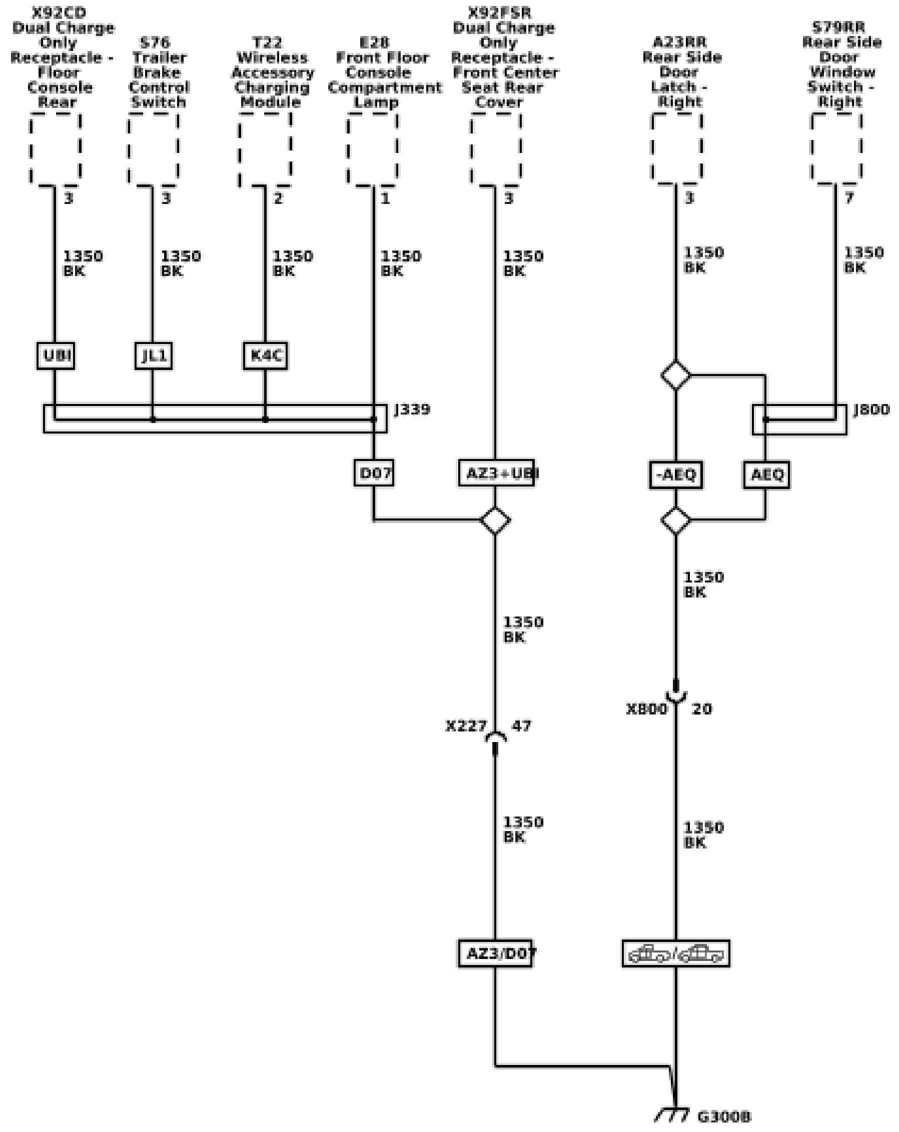
6846386

Ground Distribution Schematics (G300B - 1 of 2)


M73P Front Seat Cushion Ventilation Blower - Passenger
M73B Front Seat Back Ventilation Blower - Passenger
S65P Front Seat Lumbar Switch - Passenger
K29FV Front Seat Heater Vent Control Module
S64P Front Seat Adjuster Switch - Passenger
E63P Front Side Door Inside Handle Illumination Lamp - Right
S79P Front Side Door Window Switch - Passenger
S13P Door Lock Switch - Passenger
3
3
1
X1 8
E
2
X1 1
4 (REGULAR CAB)
5 (DOUBLE CAB/CREW CAB)
1350 BK
KQV
KQV
A7K
KA1
J379
J650
-A45
A45
A9B Outside Rearview Mirror - Passenger
E17P Outside Rearview Mirror Glass - Passenger
E3MP Front Clearance Lamp - Passenger Outside Rearview Mirror
E90P Exterior Flood Lamp - Passenger Outside Rearview Mirror
E90PC Exterior Flood Lamp - Passenger Outside Rearview Mirror Cargo
DBG/DWI/DZC
U12
DWI/DZC
DBG/DWI/DZC
X81ACA Front Floor Console Accessory Power Rear Receptacle - 110V AC
X81BCA Front Floor Console Accessory Power Rear Receptacle - 220V AC
X81FSA Accessory Power Receptacle - Front Center Seat Rear Cover 110V AC
X81FSB Accessory Power Receptacle - Front Center Seat Rear Cover 220V AC
A23P Front Side Door Latch - Passenger
M74P Front Side Door Window Regulator Motor - Passenger
X336 1
X605 10
3
1
X1 9
7
7
7
7
1050 BK
KI4
KI5
KI4
KI5
D07
AZ3
J602
X227 26
X600 47
A7K/KA1/KQV
G300B

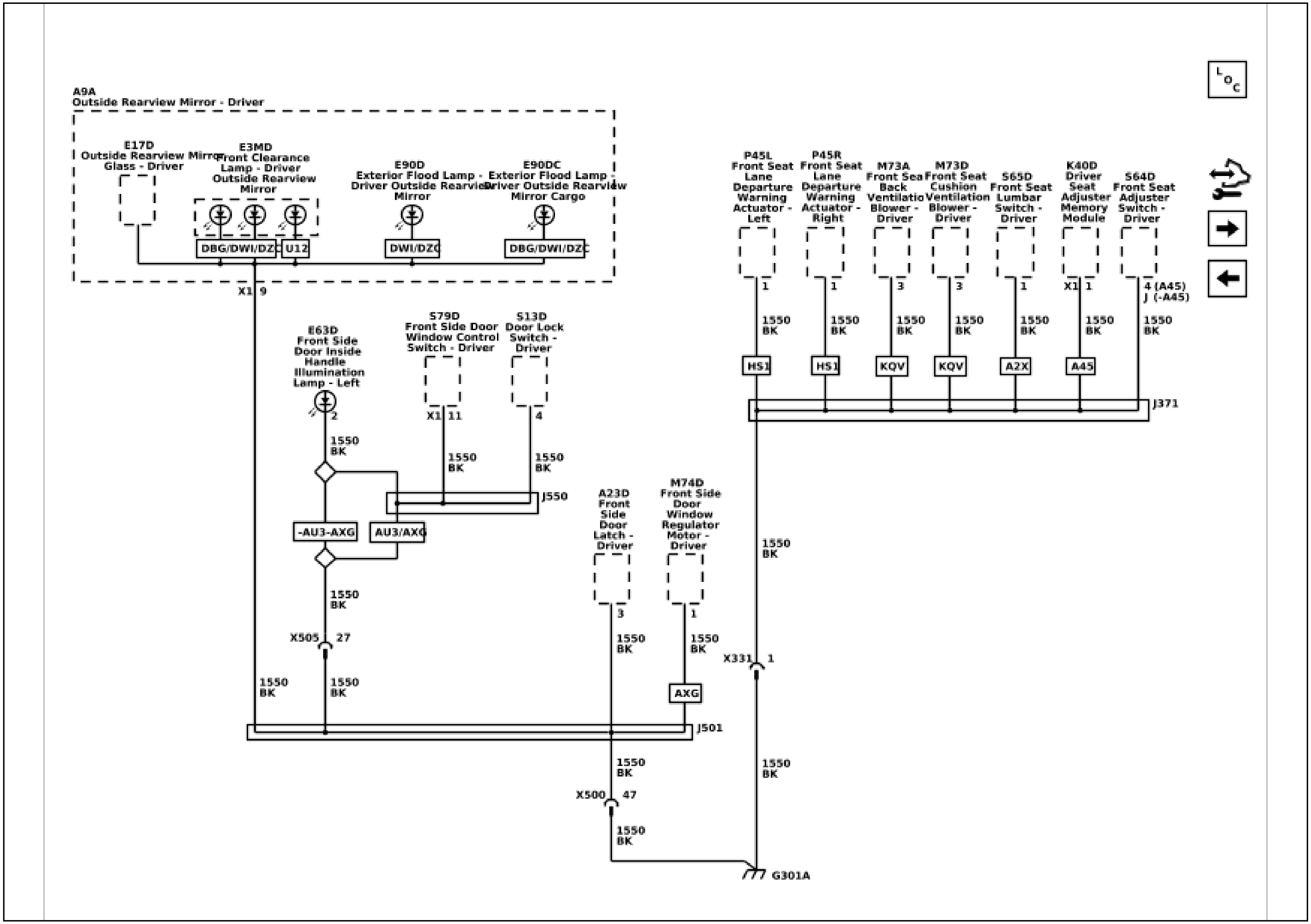
6846387

Ground Distribution Schematics (G300B - 2 of 2)


X92CD Dual Charge Only Receptacle - Floor Console Rear
S76 Trailer Brake Control Switch
T22 Wireless Accessory Charging Module
E28 Front Floor Console Compartment Lamp
X92FSR Dual Charge Only Receptacle - Front Center Seat Rear Cover
A23RR Rear Side Door Latch - Right
S79RR Rear Side Door Window Switch - Right
3
3
2
1
3
3
7
1350 BK
UBI
JL1
K4C
J339
J800
D07
AZ3+UBI
-AEQ
AEQ
X227
47
X800
20
AZ3/D07
G300B

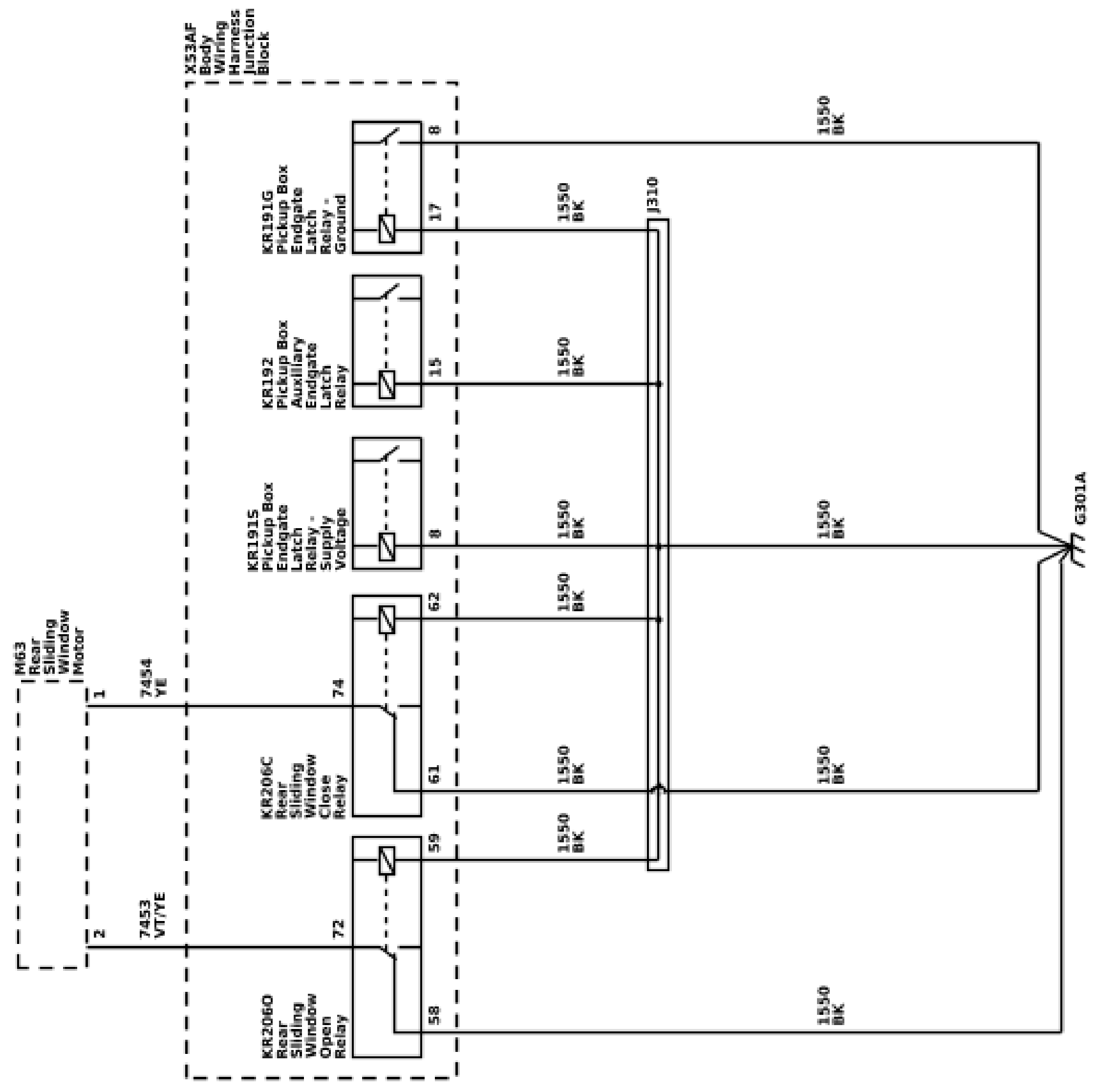
6846388

Ground Distribution Schematics (G301A - Regular Cab - 1 of 2)

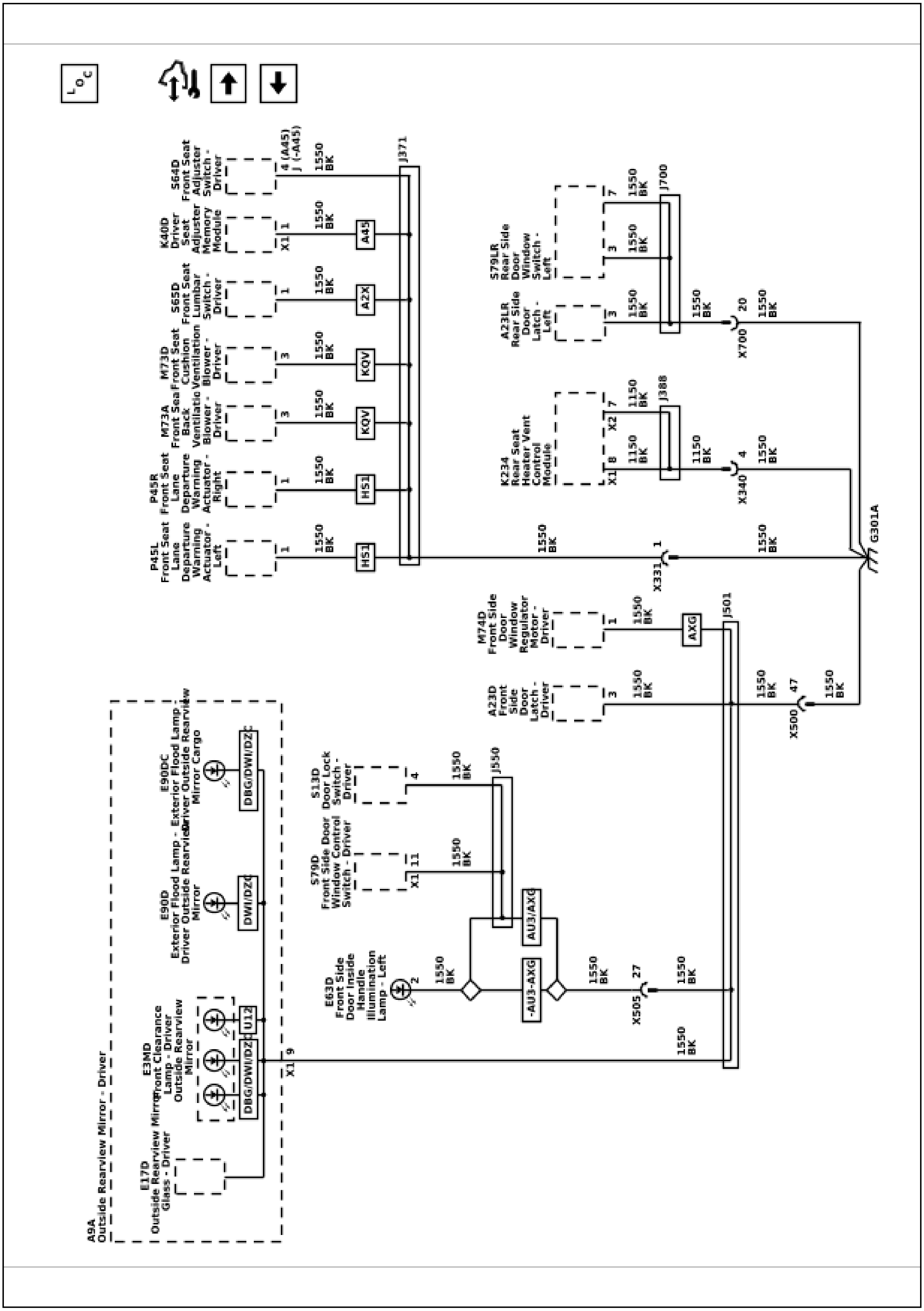

A9A
Outside Rearview Mirror - Driver
E17D
Outside Rearview Mirror Glass - Driver
E3MD
Front Clearance Lamp - Driver Outside Rearview Mirror
E90D
Exterior Flood Lamp - Driver Outside Rearview Mirror
E90DC
Exterior Flood Lamp - Driver Outside Rearview Mirror Cargo
DBG/DWI/DZC
U12
DWI/DZC
DBG/DWI/DZC
X1 9
E63D
Front Side Door Inside Handle Illumination Lamp - Left
2
S79D
Front Side Door Window Control Switch - Driver
X1 11
S13D
Door Lock Switch - Driver
4
1550 BK
J550
-AU3-AXG
AU3/AXG
X505 27
J501
A23D
Front Side Door Latch - Driver
3
M74D
Front Side Door Window Regulator Motor - Driver
1
AXG
X500 47
X331 1
G301A
P45L
Front Seat Lane Departure Warning Actuator - Left
P45R
Front Seat Lane Departure Warning Actuator - Right
M73A
Front Seat Back Ventilation Blower - Driver
M73D
Front Seat Cushion Ventilation Blower - Driver
S65D
Front Seat Lumbar Switch - Driver
K40D
Driver Seat Adjuster Memory Module
S64D
Front Seat Adjuster Switch - Driver
X1 1
4 (A45)
J (-A45)
HS1
HS1
KQV
KQV
A2X
A45
J371
6846389

Ground Distribution Schematics (G301A - Regular Cab - 2 of 2)

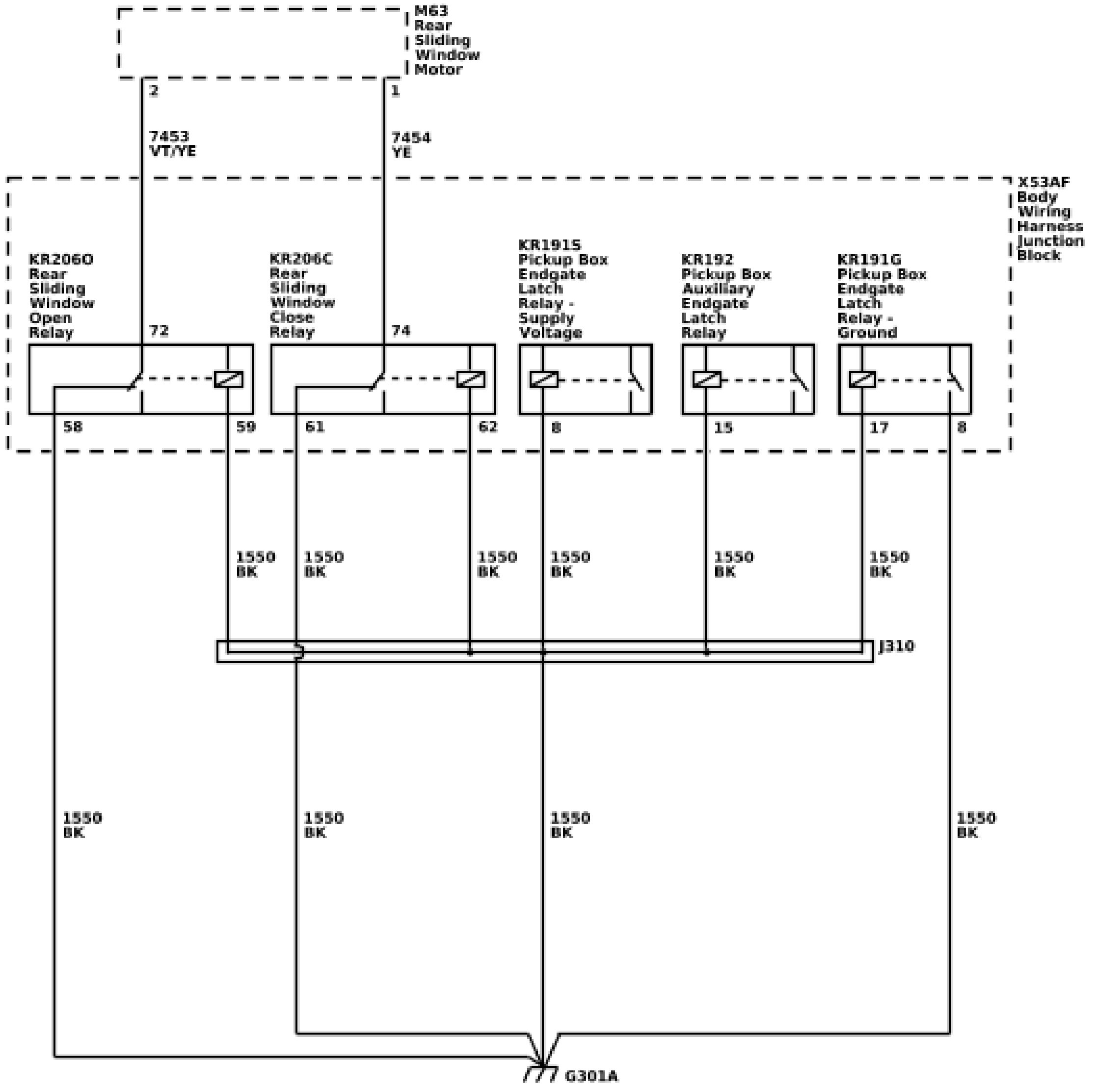
6846390


X53AF Body Wiring Harness Junction Block
KR191G Pickup Box Endgate Latch Relay - Ground
KR192 Pickup Box Auxiliary Endgate Latch Relay
KR191S Pickup Box Endgate Latch Relay - Supply Voltage
KR206C Rear Sliding Window Close Relay
KR206O Rear Sliding Window Open Relay
M63 Rear Sliding Window Motor
8
17
15
8
62
74
61
59
72
58
1
2
7454 YE
7453 VT/YE
1550 BK
J310
G301A

Ground Distribution Schematics (G301A - Double Cab/Crew Cab - 1 of 2)

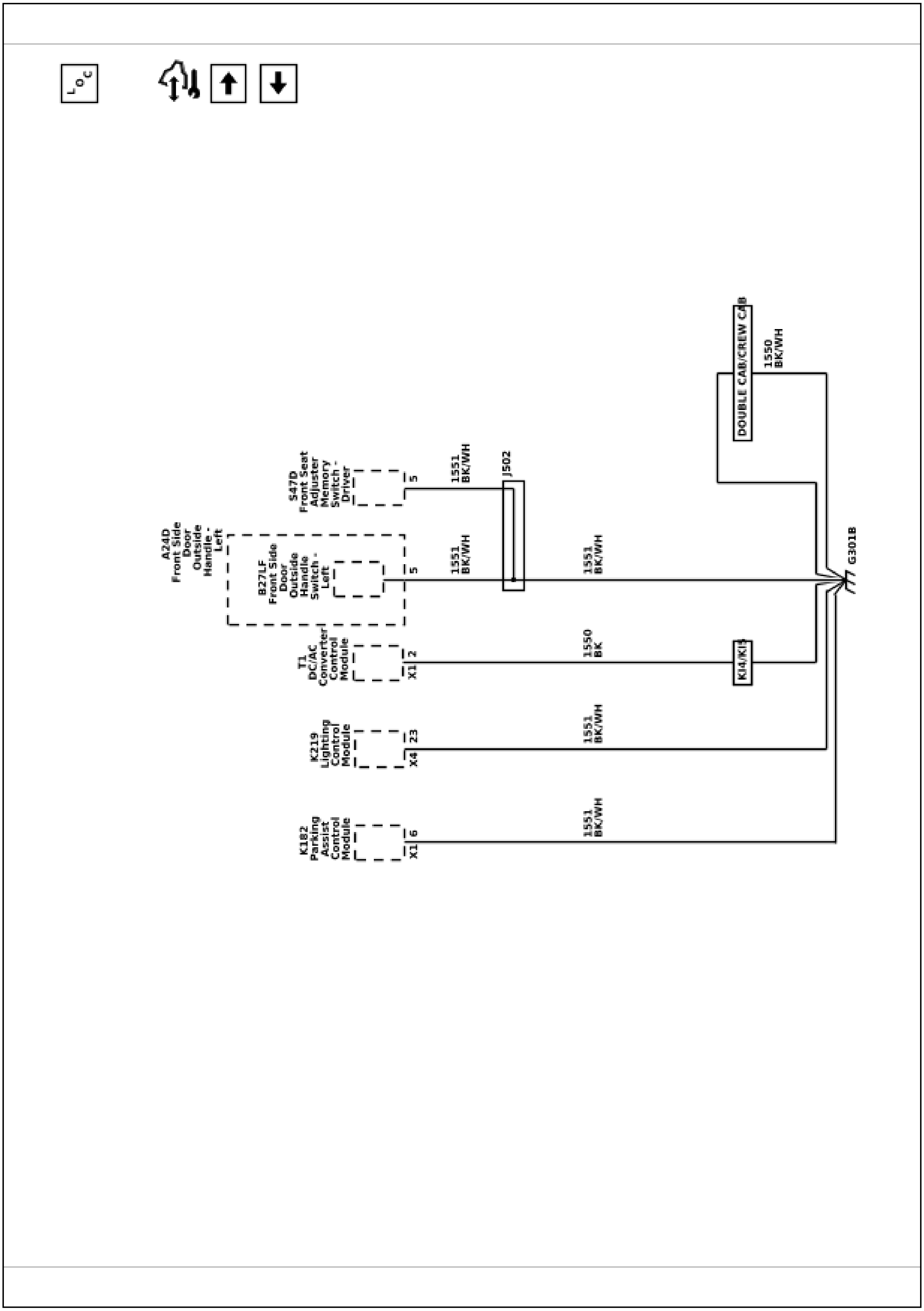

6846391
P45L Front Seat Lane Departure Warning Actuator - Left
P45R Front Seat Lane Departure Warning Actuator - Right
M73A Front Seat Back Ventilation Blower - Driver
M73D Front Seat Cushion Ventilation Blower - Driver
S65D Front Seat Lumbar Switch - Driver
K40D Driver Seat Adjuster Memory Module
S64D Front Seat Adjuster Switch - Driver
4 (A45)
J (-A45)
X1 1
1
3
1550 BK
1150 BK
H51
KQV
A2X
A45
J371
X331
1
G301A
K234 Rear Seat Heater Vent Control Module
X1 8
X2 7
J388
X340
4
A23LR Rear Side Door Latch - Left
S79LR Rear Side Door Window Switch - Left
3
7
J700
X700
20
M74D Front Side Door Window Regulator Motor - Driver
A23D Front Side Door Latch - Driver
AXG
J501
X500
47
S13D Door Lock Switch - Driver
S79D Front Side Door Window Control Switch - Driver
X1 11
J550
AU3/AXG
-AU3-AXG
E63D Front Side Door Inside Handle Illumination Lamp - Left
2
X505
27
A9A Outside Rearview Mirror - Driver
E17D Outside Rearview Mirror Glass - Driver
E3MD Front Clearance Lamp - Driver Outside Rearview Mirror
E90D Exterior Flood Lamp - Driver Outside Rearview Mirror
E90DC Exterior Flood Lamp - Driver Outside Rearview Mirror Cargo
DBG/DWI/DZ
U12
DWI/DZ
DBG/DWI/DZ
X1 9

Ground Distribution Schematics (G301A - Double Cab/Crew Cab - 2 of 2)


M63
Rear
Sliding
Window
Motor
2
1
7453
VT/YE
7454
YE
X53AF
Body
Wiring
Harness
Junction
Block
KR206O
Rear
Sliding
Window
Open
Relay
72
KR206C
Rear
Sliding
Window
Close
Relay
74
KR191S
Pickup Box
Endgate
Latch
Relay -
Supply
Voltage
KR192
Pickup Box
Auxiliary
Endgate
Latch
Relay
KR191G
Pickup Box
Endgate
Latch
Relay -
Ground
58
59
61
62
8
15
17
8
1550
BK
J310
G301A

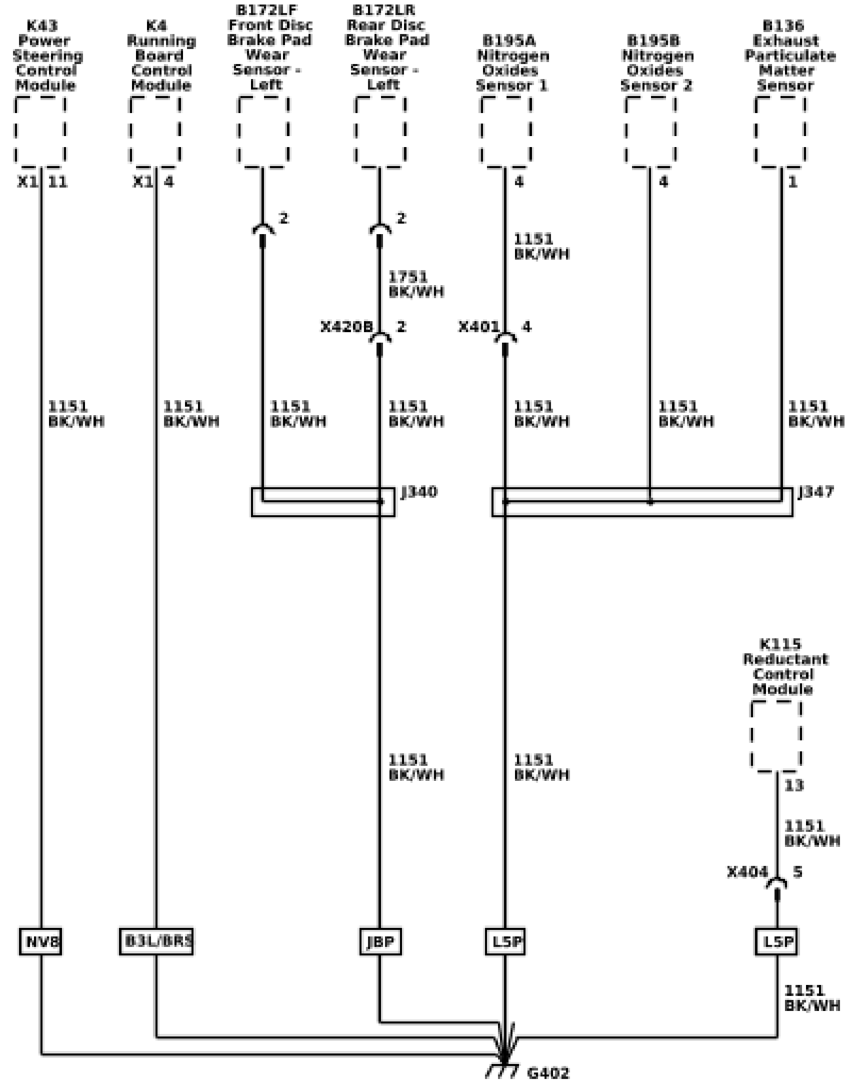
6846392

Ground Distribution Schematics (G301B)


S47D Front Seat Adjuster Memory Switch - Driver
5
1551 BK/WH
J502
A24D Front Side Door Outside Handle - Left
B27LF Front Side Door Outside Handle Switch - Left
5
1551 BK/WH
1551 BK/WH
T1 DC/AC Converter Control Module
X1 2
1550 BK
KI4/KI5
K219 Lighting Control Module
X4 23
1551 BK/WH
K182 Parking Assist Control Module
X1 6
1551 BK/WH
DOUBLE CAB/CREW CAB
1550 BK/WH
G301B

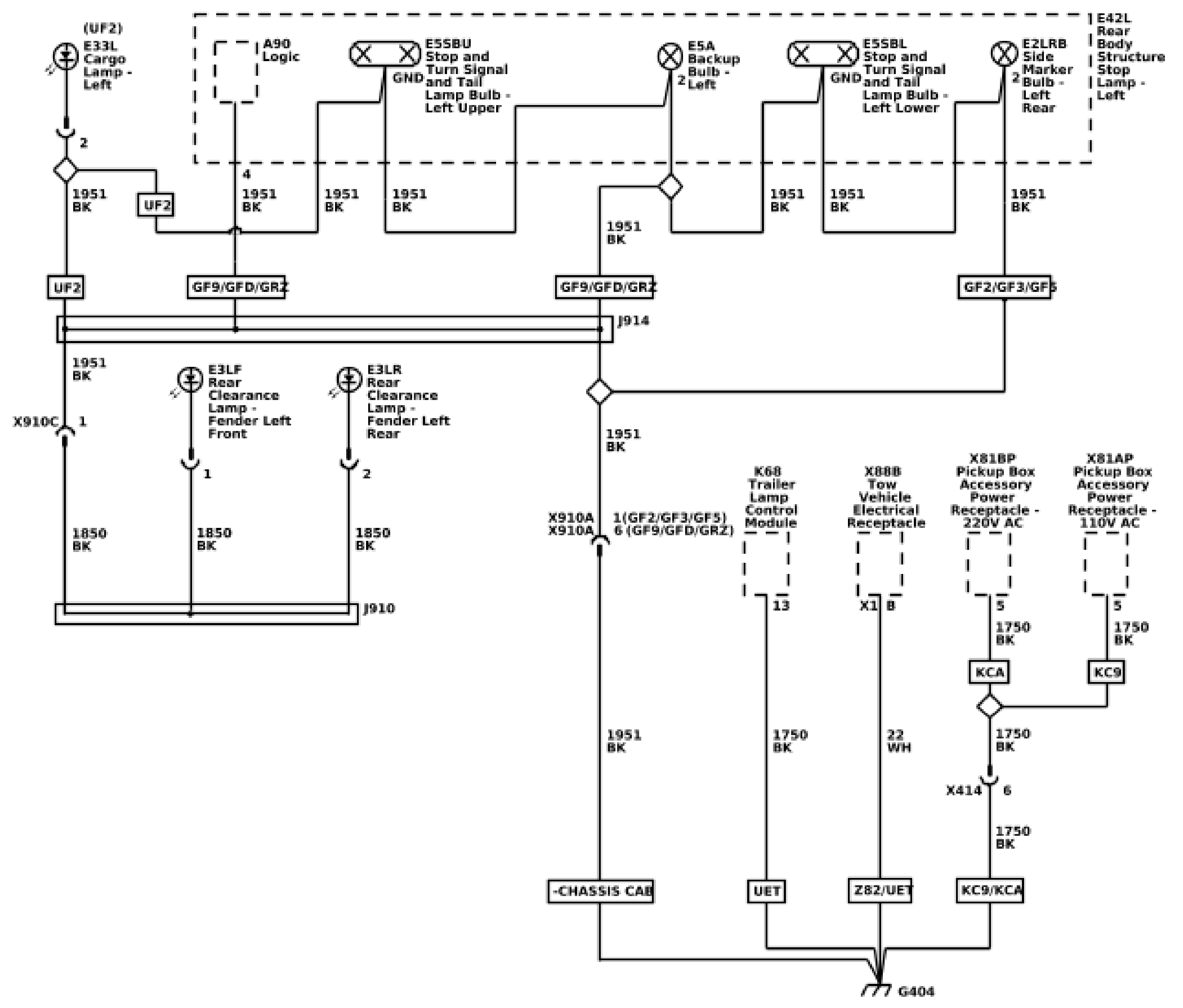
6846393

Ground Distribution Schematics (G402)


K43 Power Steering Control Module
X1 11
K4 Running Board Control Module
X1 4
B172LF Front Disc Brake Pad Wear Sensor - Left
2
B172LR Rear Disc Brake Pad Wear Sensor - Left
2
1751 BK/WH
X420B 2
B195A Nitrogen Oxides Sensor 1
4
1151 BK/WH
X401 4
B195B Nitrogen Oxides Sensor 2
4
B136 Exhaust Particulate Matter Sensor
1
1151 BK/WH
J340
J347
K115 Reductant Control Module
13
X404 5
NV8
B3L/BRS
JBP
L5P
L5P
G402

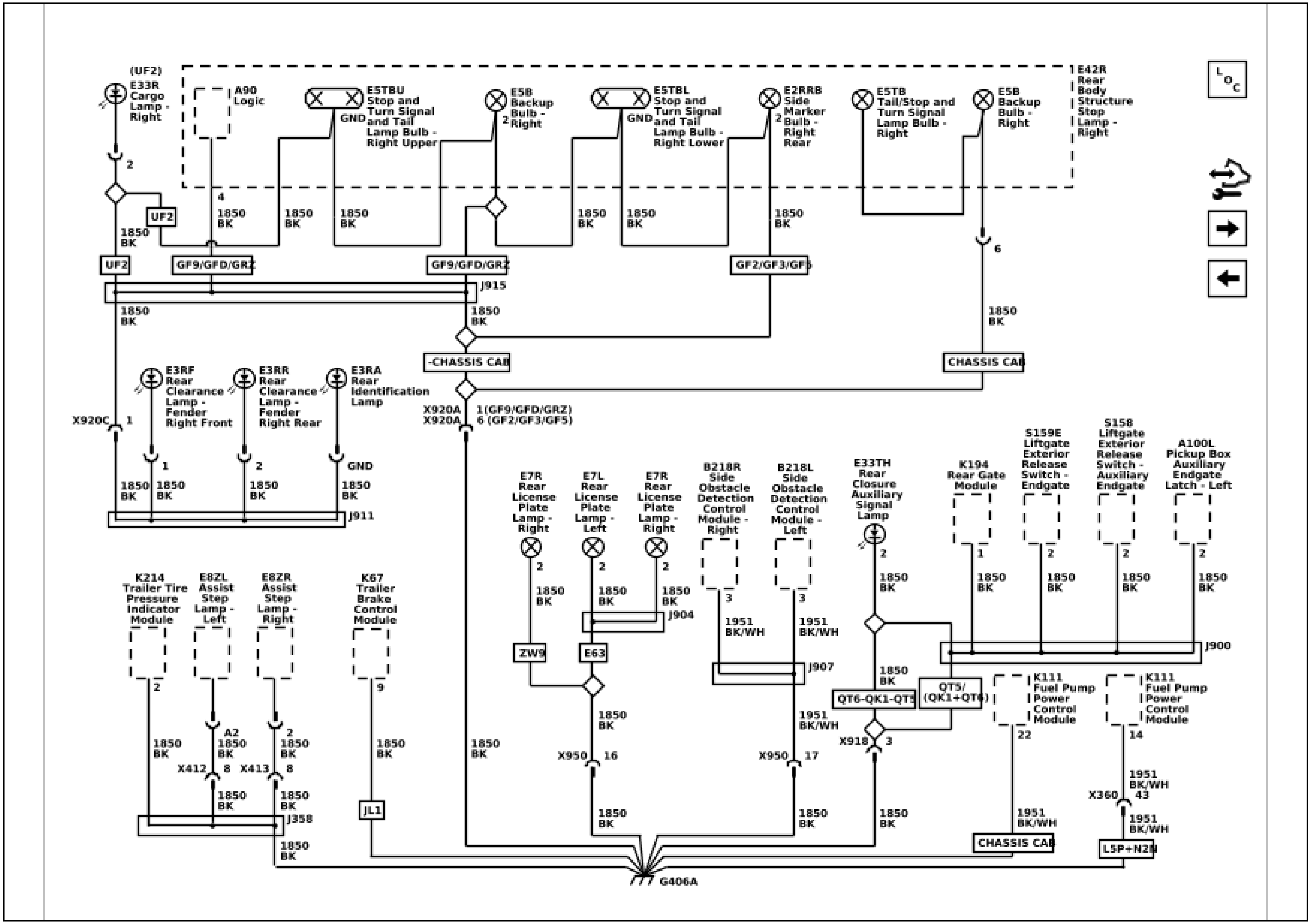
6846394

Ground Distribution Schematics (G404)


(UF2)
E33L Cargo Lamp - Left
2
1951 BK
UF2
UF2
A90 Logic
4
1951 BK
GF9/GFD/GRZ
E55BU Stop and Turn Signal and Tail Lamp Bulb - Left Upper
GND
1951 BK
1951 BK
E5A Backup Bulb - Left
2
1951 BK
GF9/GFD/GRZ
E55BL Stop and Turn Signal and Tail Lamp Bulb - Left Lower
GND
1951 BK
1951 BK
E2LRB Side Marker Bulb - Left Rear
2
1951 BK
GF2/GF3/GF5
E42L Rear Body Structure Stop Lamp - Left
J914
1951 BK
X910C 1
E3LF Rear Clearance Lamp - Fender Left Front
1
1850 BK
E3LR Rear Clearance Lamp - Fender Left Rear
2
1850 BK
1850 BK
J910
1951 BK
X910A 1(GF2/GF3/GF5)
X910A 6 (GF9/GFD/GRZ)
1951 BK
-CHASSIS CAB
K68 Trailer Lamp Control Module
13
1750 BK
UET
X88B Tow Vehicle Electrical Receptacle
X1 B
22 WH
Z82/UET
X81BP Pickup Box Accessory Power Receptacle - 220V AC
5
1750 BK
KCA
X81AP Pickup Box Accessory Power Receptacle - 110V AC
5
1750 BK
KC9
1750 BK
X414 6
1750 BK
KC9/KCA
G404

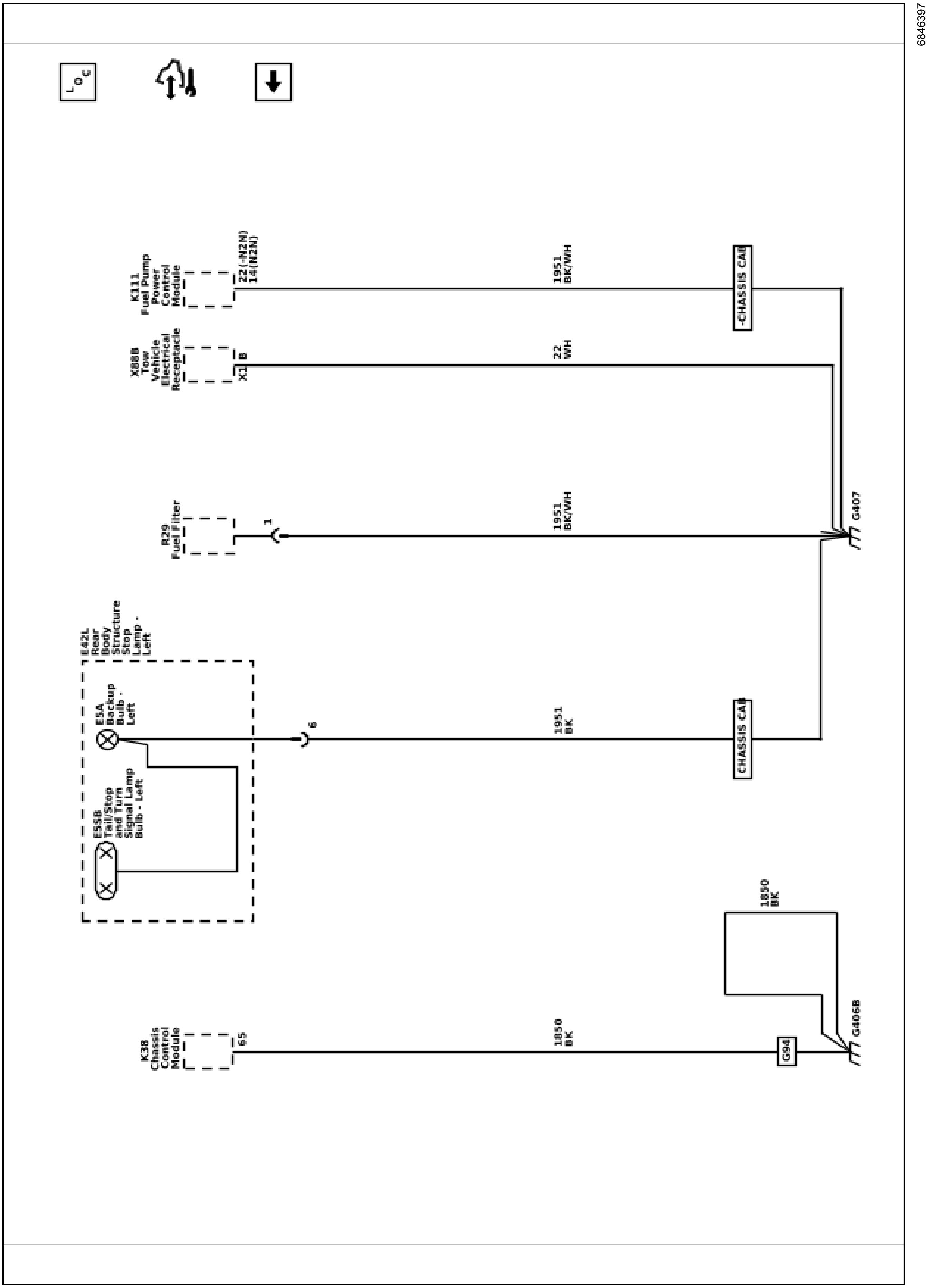
6846395

Ground Distribution Schematics (G406A)

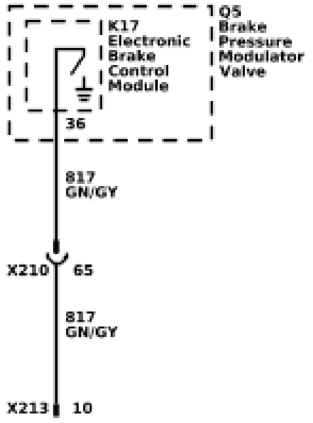

(UF2)
E33R Cargo Lamp - Right
A90 Logic
E5TBU Stop and Turn Signal and Tail Lamp Bulb - Right Upper
GND
E5B Backup Bulb - Right
E5TBL Stop and Turn Signal and Tail Lamp Bulb - Right Lower
E2RRB Side Marker Bulb - Right Rear
E5TB Tail/Stop and Turn Signal Lamp Bulb - Right
E42R Rear Body Structure Stop Lamp - Right
2
4
6
1850 BK
UF2
GF9/GFD/GRZ
GF2/GF3/GF5
J915
-CHASSIS CAB
CHASSIS CAB
E3RF Rear Clearance Lamp - Fender Right Front
E3RR Rear Clearance Lamp - Fender Right Rear
E3RA Rear Identification Lamp
X920C 1
X920A 1(GF9/GFD/GRZ)
X920A 6 (GF2/GF3/GF5)
GND
J911
E7R Rear License Plate Lamp - Right
E7L Rear License Plate Lamp - Left
B218R Side Obstacle Detection Control Module - Right
B218L Side Obstacle Detection Control Module - Left
E33TH Rear Closure Auxiliary Signal Lamp
K194 Rear Gate Module
S159E Liftgate Exterior Release Switch - Endgate
S158 Liftgate Exterior Release Switch - Auxiliary Endgate
A100L Pickup Box Auxiliary Endgate Latch - Left
J904
ZW9
E63
1951 BK/WH
J907
J900
QT6-QK1-QT5
QT5/ (QK1+QT6)
K111 Fuel Pump Power Control Module
22
14
X918 3
X950 16
X950 17
X360 43
CHASSIS CAB
L5P+N2N
K214 Trailer Tire Pressure Indicator Module
E8ZL Assist Step Lamp - Left
E8ZR Assist Step Lamp - Right
K67 Trailer Brake Control Module
9
A2
X412 8
X413 8
J358
JL1
G406A

6846396

Ground Distribution Schematics (G406B and G407)


K38 Chassis Control Module
65
1850 BK
G94
G406B
1850 BK
E42L Rear Body Structure Stop Lamp - Left
E55B Tail/Stop and Turn Signal Lamp Bulb - Left
E5A Backup Bulb - Left
6
1951 BK
CHASSIS CAB
R29 Fuel Filter
1
1951 BK/WH
G407
X88B Tow Vehicle Electrical Receptacle
X1 B
22 WH
K111 Fuel Pump Power Control Module
22(-N2N)
14(N2N)
1951 BK/WH
-CHASSIS CAB
6846397

Upfitter Provision Schematics (Upfitter Provisions - Signals)


Q5
Brake
Pressure
Modulator
Valve
K17
Electronic
Brake
Control
Module
36
817
GN/GY
X210
65
817
GN/GY
X213
10

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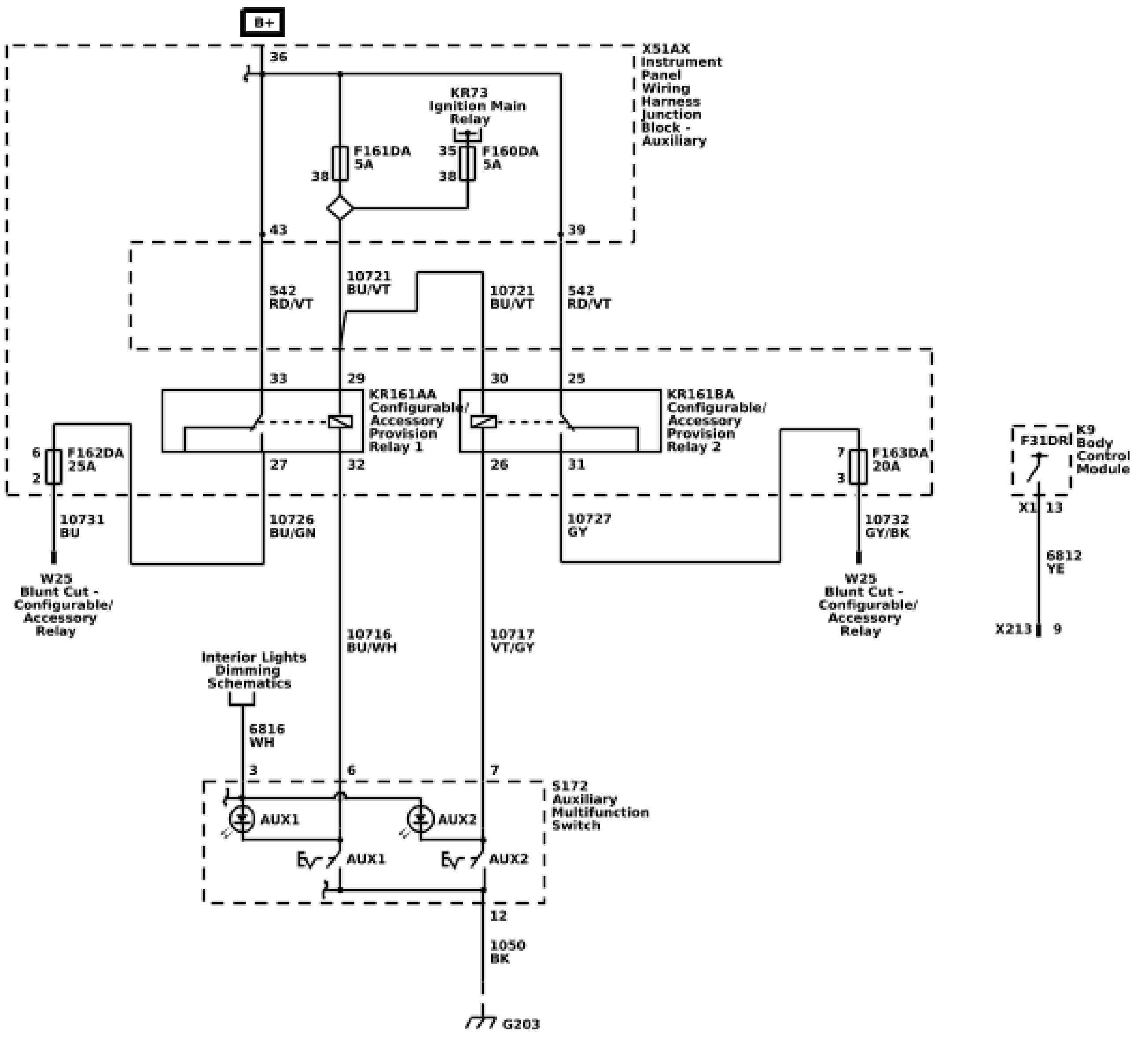
Upfitter Provision Schematics (Upfitter Provisions - 1 of 2 (9L7))


B+
36
X51AX Instrument Panel Wiring Harness Junction Block - Auxiliary
KR73 Ignition Main Relay
F161DA 5A
38
35
F160DA 5A
38
43
39
542 RD/VT
10721 BU/VT
10721 BU/VT
542 RD/VT
33
29
30
25
KR161AA Configurable/ Accessory Provision Relay 1
KR161BA Configurable/ Accessory Provision Relay 2
6
F162DA 25A
2
27
32
26
31
7
F163DA 20A
3
F31DR
K9 Body Control Module
X1
13
10731 BU
10726 BU/GN
10727 GY
10732 GY/BK
6812 YE
W25 Blunt Cut - Configurable/ Accessory Relay
W25 Blunt Cut - Configurable/ Accessory Relay
X213
9
10716 BU/WH
10717 VT/GY
Interior Lights Dimming Schematics
6816 WH
3
6
7
S172 Auxiliary Multifunction Switch
AUX1
AUX2
AUX1
AUX2
12
1050 BK
G203

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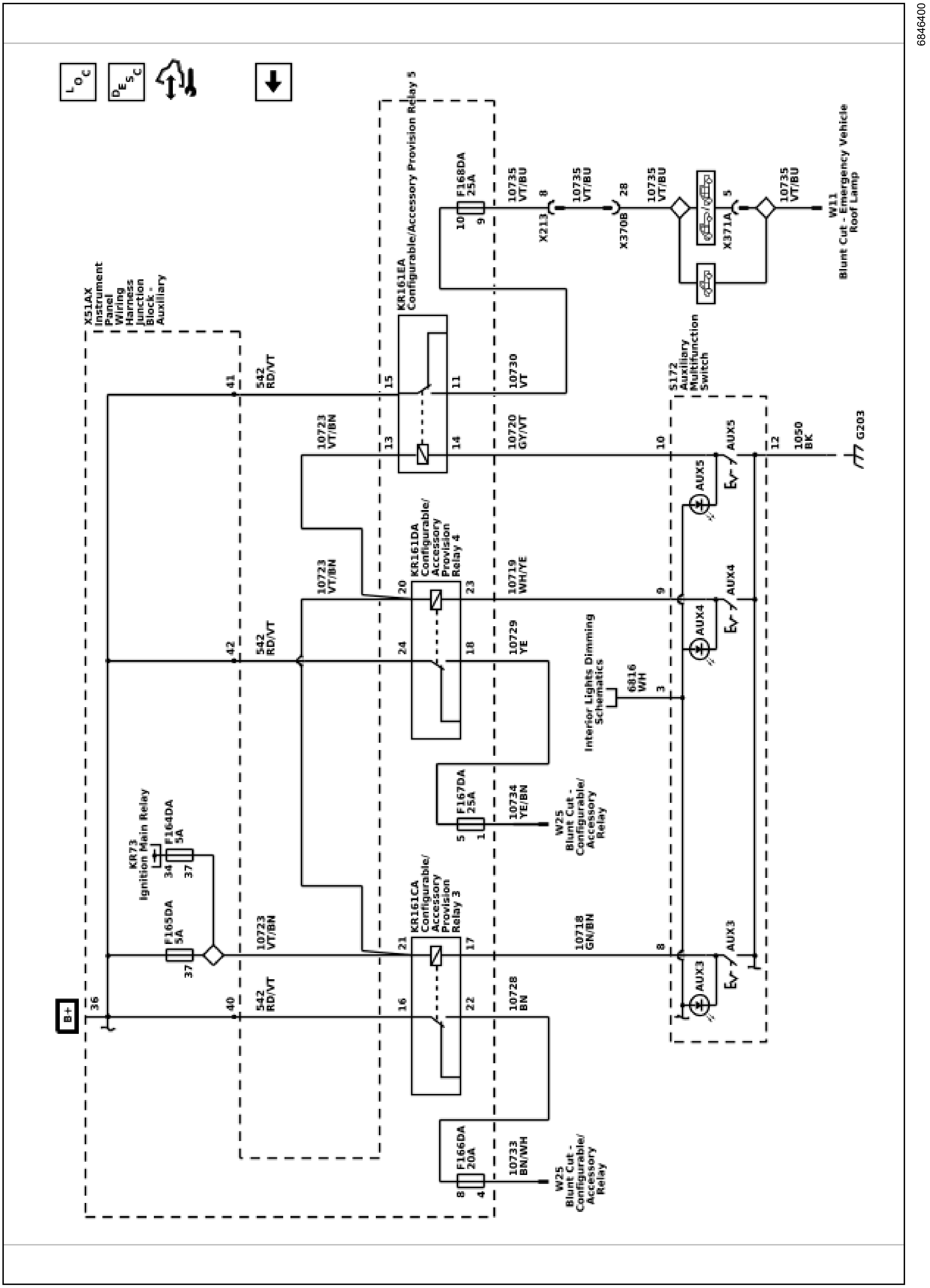
Upfitter Provision Schematics (Upfitter Provisions - 2 of 2 (9L7))


6846400
B+
36
40
41
42
542
RD/VT
X51AX
Instrument
Panel
Wiring
Harness
Junction
Block -
Auxiliary
F165DA
5A
37
KR73
Ignition Main Relay
34
F164DA
5A
37
10723
VT/BN
KR161CA
Configurable/
Accessory
Provision
Relay 3
16
21
22
17
10728
BN
10718
GN/BN
F166DA
20A
8
4
10733
BN/WH
W25
Blunt Cut -
Configurable/
Accessory
Relay
F167DA
25A
5
1
10734
YE/BN
KR161DA
Configurable/
Accessory
Provision
Relay 4
24
20
18
23
10729
YE
10719
WH/YE
KR161EA
Configurable/Accessory Provision Relay 5
15
13
11
14
10730
VT
10720
GY/VT
F168DA
25A
10
9
10735
VT/BU
X213
8
X370B
28
X371A
5
W11
Blunt Cut - Emergency Vehicle
Roof Lamp
Interior Lights Dimming
Schematics
6816
WH
3
S172
Auxiliary
Multifunction
Switch
AUX3
AUX4
AUX5
10
12
1050
BK
G203

Component Locator

Master Electrical Component List

Master Electrical Component List

Code	Name	Option	Location	Locator View	Connector End View
A3L	Sunshade - Left	—	In the passenger compartment, at the front of the headliner, left side	—	—
A3R	Sunshade - Right	—	In the passenger compartment, at the front of the headliner, right side	—	—
A7	Fuel Tank Fuel Pump Module	—	Under the vehicle, mounted in the front fuel tank	• •	
A7AX	Fuel Tank Fuel Pump Module - Auxiliary	—	under the vehicle, mounted in the rear fuel tank	—	• •
A9A	Outside Rearview Mirror - Driver	—	Outside the vehicle, at the front of the driver door		• •
A9B	Outside Rearview Mirror - Passenger	—	Outside the vehicle, at the front of the passenger door		• •
A10	Inside Rearview Mirror	—	In the passenger compartment, at the top center of the windshield	—	
A11	Radio	—	In the passenger compartment, right front, below passenger a-pillar, between the instrument panel and bulkhead	• •	• • • • • • • • • • • • • • • • •
A16	Transfer Case Four Wheel Drive Actuator	NQF / NQH	Under the vehicle, mounted to the rear of the transfer case		
A22	Radio Control	IOK	In the passenger compartment, at the center of the Instrument Panel, part of the Info Display Module		
A23D	Front Side Door Latch - Driver	—	In the driver door, at the rear center		
A23LR	Rear Side Door Latch - Left	Double Cab / Crew Cab	In the left rear door, at the rear center		

Code	Name	Option	Location	Locator View	Connector End View
A23P	Front Side Door Latch - Passenger	—	In the passenger door, at the rear center		
A23RR	Rear Side Door Latch - Right	Double Cab / Crew Cab	In the right rear door, at the rear center		
A24D	Front Side Door Outside Handle - Left	—	Outside of the vehicle, at the rear of the driver door		
A24P	Front Side Door Outside Handle - Right	—	Outside of the vehicle, at the rear of the passenger door		
A26	Heater and Air Conditioning User Interface Control - Front	—	In the passenger compartment, at the center of the instrument panel, beneath P17 Info Display Module		
A38	Reductant Tank Fluid Supply Pump Module	L5P	Under the vehicle, right side, rearward of engine compartment bulkhead, mounted in the bottom of the reductant tank	• •	
A99L	Pickup Box Endgate Latch - Left	QK2 and QT5	At the rear of the vehicle, within endgate, on the left side	—	
A99R	Pickup Box Endgate Latch - Right	QK2 and QT5	At the rear of the vehicle, within endgate, on the right side	—	
A100L	Pickup Box Auxiliary Endgate Latch - Left	QK2	At the rear of the vehicle, within endgate, on the left side	—	
A100R	Pickup Box Auxiliary Endgate Latch - Right	QK2	At the rear of the vehicle, within endgate, on the right side	—	
A103	Roof Console	—	In the passenger compartment, front center, mounted to the front center of the headliner	—	• •
B1	Air Conditioning Refrigerant Pressure Sensor	—	In the engine compartment, left front, mounted to A/C high pressure line, near G1 A/C Compressor	—	
B5LF	Front Wheel Speed Sensor - Left	—	Outside the vehicle, part of the left front wheel hub assembly		
B5LR	Rear Wheel Speed Sensor - Left	—	• (-DZW) Outside the vehicle, mounted to the outboard end of the left axle tube • (DZW) Outside the vehicle, mounted to the outboard end of the axle carrier		—
B5RF	Front Wheel Speed Sensor - Right	—	Outside the vehicle, part of the right front wheel hub assembly		

Code	Name	Option	Location	Locator View	Connector End View
B5RR	Rear Wheel Speed Sensor - Right	—	• (-DZW) Outside the vehicle, mounted to the outboard end of the right axle tube • (DZW) Outside the vehicle, mounted to the outboard end of the axle carrier		—
B9	Ambient Air Temperature Sensor	—	Outside of the vehicle, at the bottom of A9B Outside Rearview Mirror - Passenger	—	—
B10D	Sun Load and Ambient Light and Security Indicator Sensor	—	In the passenger compartment, front center, in instrument panel, mounted to the instrument panel extension		
B12P	Automatic Transmission Fluid Pressure Sensor - Power Take-Off	—	In the engine compartment, mounted to side of transmission	—	
B13	Automatic Transmission Fluid Temperature Sensor	—	Under the vehicle, inside the T12 Automatic Transmission	—	
B14A	Automatic Transmission Output Speed Sensor	—	Under the vehicle, inside the T12 Automatic Transmission	—	
B14C	Automatic Transmission Input Speed Sensor	—	Under the vehicle, inside the T12 Automatic Transmission	—	
B14DA	Automatic Transmission Intermediate Speed Sensor 1	—	Under the vehicle, inside the T12 Automatic Transmission	—	
B14DB	Automatic Transmission Intermediate Speed Sensor 2	—	Under the vehicle, inside the T12 Automatic Transmission	—	
B20A	Brake Fluid Level Indicator Switch	—	In the engine compartment, left rear, mounted in the brake fluid reservoir		
B22	Brake Pedal Position Sensor	—	In the passenger compartment, in the driver side foot well, under the instrument panel		
B23	Camshaft Position Sensor	—	• (L8T) In the engine compartment, front center, mounted to timing chain cover, above crankshaft harmonic balancer • (L5P) In the engine compartment, rear center, mounted to the right rear side of the engine block, above transmission bellhousing		• •
B24LF	Mobile Telephone Microphone - Left Front	—	In the passenger compartment, left front, attached to the headliner	—	

Code	Name	Option	Location	Locator View	Connector End View
B24RF	Mobile Telephone Microphone - Right Front	IOK	In the passenger compartment, right front, attached to the headliner	—	
B26	Crankshaft Position Sensor	—	In the engine compartment, mounted to side of engine block behind the M64 Starter Motor	• •	• •
B27LF	Front Side Door Outside Handle Switch - Left	—	Outside of the vehicle, at the rear of the driver door, within A24D Front Side Door Outside Handle - Left	—	—
B27RF	Front Side Door Outside Handle Switch - Right	—	Outside of the vehicle, at the rear of the driver door, within A24P Front Side Door Outside Handle - Right	—	—
B33	Low Coolant Level Switch	—	In the engine compartment, in the engine coolant reservoir	—	
B34	Engine Coolant Temperature Sensor	L8T	In the engine compartment, front center, mounted to water pump		• •
B35	Engine Oil Level Indicator Switch	L8T	In the engine compartment, mounted to the right side of the engine oil pan	• • •	• •
B36	Engine Oil Temperature Sensor	L8T	In the engine compartment, left side, mounted to the engine oil filter housing		
B37B	Engine Oil Pressure Sensor	—	• (L8T) In the engine compartment, front of engine, mounted below throttle body • (L5P) In the engine compartment, front center, mounted to the left side of engine block		• •
B39	Air Conditioning Evaporator Air Temperature Sensor	—	In the passenger compartment, behind the instrument panel, mounted in the HVAC housing	—	• •
B46	Fuel Level Sensor	—	Under the vehicle, inside the front fuel tank, part of the fuel pump and level sensor assembly	—	—
B46AX	Fuel Level Sensor - Auxiliary	—	Under the vehicle, inside the rear fuel tank, part of the fuel pump and level sensor assembly	—	—
B47	Fuel Pressure Sensor	—	• (L8T) Under the vehicle, left side, in front of rear axle, mounted to the top of the fuel tank • (L5P) Under the vehicle, right middle, mounted to the right inboard side frame rail, rearward of R29 Fuel Filter	• •	• •
B47B	Fuel Rail Pressure Sensor	—	In the engine compartment, at the top of the engine, mounted to the fuel rail		

Code	Name	Option	Location	Locator View	Connector End View
B52C	Heated Oxygen Sensor - Bank 1 Sensor 1	L8T	Under the vehicle, mounted in the bank 1 exhaust, upstream of the catalytic converter	—	
B52D	Heated Oxygen Sensor - Bank 1 Sensor 2	L8T	Under the vehicle, mounted in the bank 1 exhaust, downstream of the catalytic converter	—	
B52E	Heated Oxygen Sensor - Bank 2 Sensor 1	L8T	Under the vehicle, mounted in the bank 2 exhaust, upstream of the catalytic converter	—	
B52F	Heated Oxygen Sensor - Bank 2 Sensor 2	L8T	Under the vehicle, mounted in the bank 2 exhaust, downstream of the catalytic converter	—	
B55	Engine Compartment Cover Switch	—	Outside the vehicle, at the front center of the hood, part of the hood latch assembly	• •	
B58L	Airbag Front End Discriminating Sensor - Left	—	In the engine compartment, left front, at the bottom of the radiator core support	• •	
B58R	Airbag Front End Discriminating Sensor - Right	—	In the engine compartment, right front, at the bottom of the radiator core support	• •	
B61P	Seat Belt Tension Sensor - Passenger	—	In the passenger compartment, at the base of the B-pillar, part of the passenger seat belt retractor pretensioner	• •	
B63LF	Airbag Side Impact Sensor - Left Front Door	—	At the left front of the passenger compartment, mounted inside the left front door, at the bottom		
B63LR	Airbag Side Impact Rear Sensor - Left Door	Double Cab / Crew Cab	At the left rear of the passenger compartment, mounted inside the left rear door, at the bottom		
B63RF	Airbag Side Impact Sensor - Right Front Door	—	At the right front of the passenger compartment, mounted inside the right front door, at the bottom		
B63RR	Airbag Side Impact Rear Sensor - Right Door	Double Cab / Crew Cab	At the right rear of the passenger compartment, mounted inside the right rear door, at the bottom		
B66	Intake Air Temperature Sensor	L5P	In the engine compartment, right front of engine, mounted to the intake manifold		
B68A	Knock Sensor 1	L8T	In the engine compartment, left side of engine, mounted to the rear of the engine block, below exhaust manifold		
B68B	Knock Sensor 2	L8T	In the engine compartment, right rear, mounted to right rear side of engine block, behind M64 Starter Motor		

Code	Name	Option	Location	Locator View	Connector End View
B74	Manifold Absolute Pressure Sensor	—	• (L8T) In the engine compartment, front center, mounted to intake manifold, to the left of Q38 Throttle Body • (L5P) In the engine compartment, right front, mounted to intake manifold, above the Q20 Intake Air Flow Valve	• • •	• •
B75	Mass Airflow Sensor	—	In the engine compartment, left front, mounted to the air cleaner lid		
B81B	Automatic Transmission Control Park Position Switch	—	In the passenger compartment, left front, inside of S3 Automatic Transmission Control	—	—
B87	Rearview Driver Information Camera	UVB / UV2	Outside the vehicle, at the top middle of the tailgate, mounted in the tailgate handle	• •	• •
B87CA	Auxiliary Rearview Camera - Cargo Area	UVN	Outside of the vehicle, at the rear of the cab, back of roof, within E6 Center High Mounted Stop Lamp	—	• •
B88D	Seat Belt Switch - Driver	—	In the passenger compartment, at the inboard side of the driver seat, part of the seat belt buckle	—	—
B88LR	Seat Belt Switch - Left Rear	—	In the passenger compartment, at the inboard side of the rear seat left, part of the seat belt buckle	—	—
B88MR	Seat Belt Switch - Rear Middle	—	In the passenger compartment, at the right side of the rear seat middle, part of the seat belt buckle	—	—
B88P	Seat Belt Switch - Passenger	—	In the passenger compartment, at the inboard side of the passenger seat, part of the seat belt buckle	—	—
B88RR	Seat Belt Switch - Right Rear	—	In the passenger compartment, at the inboard side of the rear seat right, part of the seat belt buckle	—	—
B99	Steering Angle Sensor Module	—	In the passenger compartment, near the base of the steering column, near the floor		
B107	Accelerator Pedal Position Sensor	—	In the passenger compartment, in the driver side foot well, under the instrument panel		
B110	Battery Monitor Module	—	In the engine compartment, right side, near C1 Battery negative cable		• •
B117A	Windshield Outside Moisture/ Ambient Light and Humidity Sensor	—	In the passenger compartment, at the top center of the windshield, forward of windshield multifunction sensor mount bracket cover insert	—	

Code	Name	Option	Location	Locator View	Connector End View
B118	Windshield Washer Solvent Container Level Sensor	—	At the left front corner of vehicle, forward of the front wheelhouse liner, at the bottom of the washer fluid reservoir		
B130	Exhaust Gas Recirculation Temperature Sensor	—	In the engine compartment, right front, mounted in exhaust, in front of B345P Exhaust Pressure Differential Sensor - Particulate Filter		
B136	Exhaust Particulate Matter Sensor	L5P	On the underbody, mounted to the inboard side of the right frame rail, forward of the right rear shock	—	
B139	Transfer Case Two/Four Wheel Drive Actuator Position Sensor	NQF / NQH	Under the vehicle, mounted to the transfer case		
B150	Fuel Tank Pressure Sensor	L8T	Under the vehicle, at the top of the fuel tank		• •
B153D	Front Seat Belt Buckle - Driver	—	In the passenger compartment, at the inboard side of the drive seat		
B153LR	Rear Seat Belt Buckle - Left	—	In the passenger compartment, at the inboard side of the rear seat left	• •	
B153P	Front Seat Belt Buckle - Passenger	—	In the passenger compartment, at the inboard side of the passenger seat	—	
B153RR	Rear Seat Belt Buckle - Right	—	In the passenger compartment, at the inboard side of the rear seat right	• •	
B172LF	Front Disc Brake Pad Wear Sensor - Left	—	Under the vehicle, at left front caliper		
B172LR	Rear Disc Brake Pad Wear Sensor - Left	—	Under the vehicle, at left rear caliper	—	
B174G	Front View Driver Information Camera - Grille	UV2	At the front of the vehicle, front center, near the grille		
B174W	Front View Camera - Windshield	ASV	In the passenger compartment, at the top middle of the windshield	—	
B193A	Charge Air Cooler Air Temperature Sensor - Inlet	L5P	In the engine compartment, mounted to the left side of the air charge cooler		
B193B	Charge Air Cooler Air Temperature Sensor - Outlet	L5P	In the engine compartment, mounted to the front of the air charge cooler	—	
B194	Reductant Pressure Sensor	L5P	Under the vehicle, right side, forward of rear axle, within reductant tank, part of A38 Reductant Tank Fluid Supply Pump Module	—	—
B195A	Nitrogen Oxides Sensor 1	L5P	In the engine compartment, attached to the exhaust pipe, on the top left rear side of the engine	—	

Code	Name	Option	Location	Locator View	Connector End View
B195B	Nitrogen Oxides Sensor 2	L5P	Under the vehicle, attached to the exhaust pipe, at the middle of the diesel particulate filter	—	
B198	Fuel Composition Sensor	FHS	Under the vehicle, mounted to the left side of the frame	—	
B212	Reductant Tank Fluid Sensor	L5P	Under the vehicle, right side, attached to reductant tank	• •	
B214	Reductant Tank Temperature Sensor	L5P	Under the vehicle, right side, forward of rear axle, within reductant tank, part of A38 Reductant Tank Fluid Supply Pump Module	—	—
B218L	Side Obstacle Detection Control Module - Left	UKC	Outside of the vehicle, left rear corner, mounted to the inside of the rear bumper		
B218R	Side Obstacle Detection Control Module - Right	UKC	Outside of the vehicle, right rear corner, mounted to the inside of the rear bumper		
B225L	Side View Driver Information Camera - Left	UV2	Outside of vehicle, left side, within A9A Outside Rearview Mirror - Driver	—	—
B225R	Side View Driver Information Camera - Right	UV2	Outside of vehicle, right side, within A9B Outside Rearview Mirror - Passenger	—	—
B302	Steering Gear Pressure Sensor	—	In the passenger compartment, on the steering column near the base of the shifter	—	—
B303	Transmission Range Sensor	—	Under the vehicle, inside the T12 Automatic Transmission	—	
B306A	Parking Assist Alarm Sensor - Front Left Outer	UD5	At the front of the vehicle, left side, mounted in the front bumper		
B306B	Parking Assist Alarm Sensor - Front Left Middle	UD5	At the front of the vehicle, left of center, mounted in the front bumper		
B306C	Parking Assist Alarm Sensor - Front Right Middle	UD5	At the front of the vehicle, right of center, mounted in the front bumper		
B306D	Parking Assist Alarm Sensor - Front Right Outer	UD5	At the front of the vehicle, right side, mounted in the front bumper		
B306E	Parking Assist Alarm Sensor - Rear Left Outer	UD5 / UD7	At the rear of the vehicle, left side, mounted in the rear bumper	• •	
B306F	Parking Assist Alarm Sensor - Rear Left Middle	UD5 / UD7	At the rear of the vehicle, left of center, mounted in the rear bumper	• •	
B306G	Parking Assist Alarm Sensor - Rear Right Middle	UD5 / UD7	At the rear of the vehicle, right of middle, mounted in the rear bumper	• •	
B306H	Parking Assist Alarm Sensor - Rear Right Outer	UD5 / UD7	At the rear of the vehicle, right side, in the rear bumper	• •	

Code	Name	Option	Location	Locator View	Connector End View
B310	Fuel Pressure and Temperature Sensor	L8T	In the engine compartment, rear center, under intake manifold, at the rear of the driver side fuel rail		
B321	Crankcase Pressure Sensor	—	In the engine compartment, mounted to the left side of the engine	—	
B345P	Exhaust Pressure Differential Sensor - Particulate Filter	L5P	Under the vehicle, right side, near transmission cross member, mounted to the exhaust particulate filter		
B352	Video Display Inside Rearview Mirror Camera	DRZ	Outside the vehicle, at the top center of the rear window bridge, within E6 Center High Mounted Stop Lamp		
B359	Exhaust Gas Temperature Sensor Module	L5P	In the engine compartment, right rear, mounted to exhaust, just above the Q61B Reductant Fluid Injector 2		
B359B	Exhaust Gas Temperature Sensor Module 2	L5P	Under the vehicle, right side, near transmission cross member	—	
B359C	Exhaust Gas Temperature Sensor Module 3	L5P	Under the vehicle, right side, inside the frame rail near rear of cab	—	
B394	Evaporative Emission Canister Purge System Pressure Sensor	—	On the underbody, at the top left side of the fuel tank		
C1	Battery	—	In the engine compartment, on the right side	—	—
C1B	Battery - Auxiliary	K4Z / KHF	In the engine compartment, on the left side	—	—
C1D	Battery 2	K4Z	In the engine compartment, on the left side	—	
E2LF	Front Side Marker Lamp - Left	GF9 / GFD / GRZ	Outside the vehicle, at the left front corner, inside the E13LA Front Headlamp - Left	—	
E2LRB	Side Marker Bulb - Left Rear	GF9 / GFD / GRZ	At the left rear of the vehicle, within E42L Rear Body Structure Stop Lamp - Left	—	—
E2RF	Front Side Marker Lamp - Right	GF9 / GFD / GRZ	Outside the vehicle, at the right front corner, inside the E13LA Front Headlamp - Left	—	
E2RRB	Side Marker Bulb - Right Rear	GF9 / GFD / GRZ	At the right rear of the vehicle, within E42R Rear Body Structure Stop Lamp - Right	—	—
E3A	Front Clearance Lamp - Roof Left Outer	—	Outside the vehicle, at the front of the roof	—	
E3E	Front Clearance Lamp - Roof Right Outer	—	Outside the vehicle, at the front of the roof	—	

Code	Name	Option	Location	Locator View	Connector End View
E3FA	Front Identification Lamp	—	Outside the vehicle, at the front of the roof	—	
E3LF	Rear Clearance Lamp - Fender Left Front	DRZ	Outside the vehicle, on the left rear wheel fender flare - Front	—	
E3LR	Rear Clearance Lamp - Fender Left Rear	DRZ	Outside the vehicle, on the left rear wheel fender flare - Rear	—	
E3MD	Front Clearance Lamp - Driver Outside Rearview Mirror	—	Outside of vehicle, left side, within A9A Outside Rearview Mirror - Driver	—	—
E3MP	Front Clearance Lamp - Passenger Outside Rearview Mirror	—	Outside of vehicle, right side, within A9B Outside Rearview Mirror - Passenger	—	—
E3RA	Rear Identification Lamp	—	Outside of vehicle, above center of bumper	—	—
E3RF	Rear Clearance Lamp - Fender Right Front	DRZ	Outside the vehicle, on the right rear wheel fender flare - Front	—	
E3RR	Rear Clearance Lamp - Fender Right Rear	DRZ	Outside the vehicle, on the right rear wheel fender flare - Rear	—	
E4E	High Beam Headlamp Bulb - Left	T4A	At the left front of vehicle, within E13LA Front Headlamp - Left	—	—
E4F	High Beam Headlamp Bulb - Right	T4A	At the right front of vehicle, within E13RA Front Headlamp - Right	—	—
E4G	Low Beam Headlamp Bulb - Left	T4A	At the left front of vehicle, within E13LA Front Headlamp - Left	—	—
E4H	Low Beam Headlamp Bulb - Right	T4A	At the right front of vehicle, within E13RA Front Headlamp - Right	—	—
E4NB	Parking and Turn Signal Lamp Bulb - Left	—	In E13LA Front Headlamp - Left	—	—
E4PB	Parking and Turn Signal Lamp Bulb - Right	—	In E13RA Front Headlamp - Right	—	—
E5A	Backup Bulb - Left	—	At the rear of vehicle, left rear corner, within E42L Rear Body Structure Stop Lamp - Left	—	—
E5B	Backup Bulb - Right	—	At the rear of vehicle, right rear corner, within E42R Rear Body Structure Stop Lamp - Right	—	—
E5SB	Tail/Stop and Turn Signal Lamp Bulb - Left	ZW9	Outside of the vehicle, at the left rear corner of the cargo box, within E42L Rear Body Structure Stop Lamp - Left	—	—
E5SBL	Stop and Turn Signal and Tail Lamp Bulb - Left Lower	GF2 / GF3 / GF5	Outside of the vehicle, at the left rear corner of the cargo box, within E42L Rear Body Structure Stop Lamp - Left	—	—

Code	Name	Option	Location	Locator View	Connector End View
E5SBU	Stop and Turn Signal and Tail Lamp Bulb - Left Upper	GF2 / GF3 / GF6	Outside of the vehicle, at the left rear corner of the cargo box, within E42L Rear Body Structure Stop Lamp - Left	—	—
E5TB	Tail/Stop and Turn Signal Lamp Bulb - Right	ZW9	Outside of the vehicle, at the right rear corner of the cargo box, within E42R Rear Body Structure Stop Lamp - Right	—	—
E5TBL	Stop and Turn Signal and Tail Lamp Bulb - Right Lower	GF2 / GF3 / GF5	Outside of the vehicle, at the right rear corner of the cargo box, within E42R Rear Body Structure Stop Lamp - Right	—	—
E5TBU	Stop and Turn Signal and Tail Lamp Bulb - Right Upper	GF2 / GF3 / GF6	Outside of the vehicle, at the right rear corner of the cargo box, within E42R Rear Body Structure Stop Lamp - Right	—	—
E6A	High Mount Stop and Cargo Lamp	—	Outside the vehicle, at the top center of the rear window bridge	—	• •
E6B	High Mount Stop Lamp Bulb	—	Outside the vehicle, at the top center of the rear window bridge	—	
E7	Rear License Plate Lamp	ZW9	Outside the vehicle, mounted in the left frame rail	—	—
E7L	Rear License Plate Lamp - Left	E63	Outside the vehicle, mounted in the middle of the rear bumper	• •	
E7R	Rear License Plate Lamp - Right	E63	Outside the vehicle, mounted in the middle of the rear bumper	• •	
E8ZL	Assist Step Lamp - Left	BRS	Under the vehicle, along the left frame rail, under the driver door	—	—
E8ZR	Assist Step Lamp - Right	BRS	Under the vehicle, along the right frame rail, under the passenger door	—	—
E12A	Glow Plug 1	L5P	In the engine compartment, In the cylinder head at cylinder 1		
E12B	Glow Plug 2	L5P	In the engine compartment, In the cylinder head at cylinder 2		
E12C	Glow Plug 3	L5P	In the engine compartment, In the cylinder head at cylinder 3		
E12D	Glow Plug 4	L5P	In the engine compartment, In the cylinder head at cylinder 4		
E12E	Glow Plug 5	L5P	In the engine compartment, In the cylinder head at cylinder 5		
E12F	Glow Plug 6	L5P	In the engine compartment, In the cylinder head at cylinder 6		

Code	Name	Option	Location	Locator View	Connector End View
E12G	Glow Plug 7	L5P	In the engine compartment, In the cylinder head at cylinder 7		
E12H	Glow Plug 8	L5P	In the engine compartment, In the cylinder head at cylinder 8		
E13LA	Front Headlamp - Left	—	Outside the vehicle, at the left front corner		
E13RA	Front Headlamp - Right	—	Outside the vehicle, at the right front corner		
E14A	Front Seat Back Heater - Driver	KA1 / KQV	In the passenger compartment, in the driver seat back		
E14B	Front Seat Cushion Heater - Driver	KA1 / KQV	In the passenger compartment, in the driver seat cushion		
E14C	Front Seat Back Heater - Passenger	KA1 / KQV	In the passenger compartment, in the passenger seat back		
E14D	Front Seat Cushion Heater - Passenger	KA1 / KQV	In the passenger compartment, in the passenger seat cushion		
E14F	Rear Seat Cushion Heater - Left Rear	KA6	In the passenger compartment, in the left rear seat cushion		
E14H	Rear Seat Cushion Heater - Right Rear	KA6	In the passenger compartment, in the right rear seat cushion		
E15	Steering Wheel Heater	KI3	In the passenger compartment, left front, part of the steering wheel	—	—
E17D	Outside Rearview Mirror Glass - Driver	—	Outside the vehicle, at the front of the driver door, part of A9A Outside Rearview Mirror - Driver	—	—
E17P	Outside Rearview Mirror Glass - Passenger	—	Outside the vehicle, at the front of the passenger door, part of A9B Outside Rearview Mirror - Passenger	—	—
E18	Rear Window Defogger Grid	—	At the rear of the passenger compartment, part of the rear window glass	• •	• •
E28	Front Floor Console Compartment Lamp	D07	In the passenger compartment, between the front seats, inside the floor console storage bin		
E29LF	Front Fog Lamp - Left	T3U	Outside the vehicle, at the left front corner, in the front bumper, below E13LA Front Headlamp - Left		
E29RF	Front Fog Lamp - Right	T3U	Outside the vehicle, at the right front corner, in the front bumper, below E13RA Front Headlamp - Right		
E31L	Sunshade Mirror Lamp - Left	DH6	In the passenger compartment, at the left front of the headliner, part of A3L Sunshade - Left	—	

Code	Name	Option	Location	Locator View	Connector End View
E31R	Sunshade Mirror Lamp - Right	DH6	In the passenger compartment, at the right front of the headliner, part of A3R Sunshade - Right	—	
E33L	Cargo Lamp - Left	—	Outside the vehicle, beneath the top of the left side of the bed left rear	—	—
E33LB	Cargo Box Lamp Bulb - Left	—	In the rear cargo box, left side	—	
E33R	Cargo Lamp - Right	—	Outside the vehicle, beneath the top of the right side of the bed right rear	—	—
E33RB	Cargo Box Lamp Bulb - Right	—	In the rear cargo box, right side	—	
E33TH	Rear Closure Auxiliary Signal Lamp	—	At the rear of the vehicle, in the center of the endgate	• •	
E37SMC	Rear Seat Position Center Reading and Courtesy Lamp	Double Cab / Crew Cab	In the passenger compartment, rear center, mounted to headliner	—	
E40	Air Heater	C32	In the passenger compartment, at the top of the HVAC box	—	
E42L	Rear Body Structure Stop Lamp - Left	—	Outside vehicle at rear		—
E42R	Rear Body Structure Stop Lamp - Right	—	Outside vehicle at rear		—
E52	Reductant Heater 2 - Injector Supply Pipe	L5P	Under the vehicle, left side, forward of rear axle, attached to reductant line, near reductant tank	• •	
E53A	Reductant Heater 1 - Tank	—	Under the vehicle, left side, forward of rear axle, within reductant tank, part of A38 Reductant Tank Fluid Supply Pump Module	—	—
E53C	Reductant Heater 3 - Tank	—	Under the vehicle, left side, forward of rear axle, within reductant tank, part of A38 Reductant Tank Fluid Supply Pump Module	—	—
E63D	Front Side Door Inside Handle Illumination Lamp - Left	—	In the passenger compartment, in the driver door handle trim panel	—	
E63P	Front Side Door Inside Handle Illumination Lamp - Right	—	In the passenger compartment, in the passenger door handle trim panel	—	
E90D	Exterior Flood Lamp - Driver Outside Rearview Mirror	DEZ	Outside of vehicle, left side, mounted to the bottom of A9A Outside Rearview Mirror - Driver	—	—
E90DC	Exterior Flood Lamp - Driver Outside Rearview Mirror Cargo	DPO / DQS	Outside of the vehicle, left side, at the front of A9A Outside Rearview Mirror - Driver	—	—

Code	Name	Option	Location	Locator View	Connector End View
E90P	Exterior Flood Lamp - Passenger Outside Rearview Mirror	DEZ	Outside of vehicle, right side, mounted to the bottom of A9B Outside Rearview Mirror - Passenger	—	—
E90PC	Exterior Flood Lamp - Passenger Outside Rearview Mirror Cargo	DPO / DQS	Outside of the vehicle, right side, at the front of A9B Outside Rearview Mirror - Passenger	—	—
F101	Instrument Panel Airbag	—	In the passenger compartment, behind the instrument panel upper glove box		—
F105L	Front and Rear Row Roof Rail Airbag - Left	DOUBLE CAB / CREW CAB	In the passenger compartment, along the left side of the headliner		
F105LF	Front Row Roof Rail Airbag - Left	REGULAR CAB	In the passenger compartment, along the left side of the headliner		
F105R	Front and Rear Row Roof Rail Airbag - Right	DOUBLE CAB / CREW CAB	In the passenger compartment, along the right side of the headliner		
F105RF	Front Row Roof Rail Airbag - Right	REGULAR CAB	In the passenger compartment, along the right side of the headliner		
F106D	Front Seat Outboard Seat Back Airbag - Driver	—	In the passenger compartment, in the outboard side of the driver seat back		
F106P	Front Seat Outboard Seat Back Airbag - Passenger	—	In the passenger compartment, in the outboard side of the passenger seat back		
F107	Steering Wheel Airbag	—	In the passenger compartment, mounted to the middle of the steering wheel		• •
F112D	Front Seat Belt Retractor - Driver	—	In the passenger compartment, at the base of the driver side B-pillar	• •	
F112P	Front Seat Belt Retractor - Passenger	—	In the passenger compartment, at the base of the passenger side B-pillar	• •	
F113D	Front Seat Belt Anchor Plate Tensioner - Driver	—	In the passenger compartment, mounted to the outboard driver seat track	• •	
F113P	Front Seat Belt Anchor Plate Tensioner - Passenger	—	In the passenger compartment, mounted to the outboard passenger seat track	• •	
G1	Air Conditioning Compressor	—	In the engine compartment, left front, mounted to the left lower side of the engine	—	• •
G12	Fuel Pump	—	Under the vehicle, within the front fuel tank, part of A7 Fuel Tank Fuel Pump Module	—	—
G12AX	Fuel Pump - Auxiliary	—	Under the vehicle, within the rear fuel tank, part of A7AX Fuel Tank Fuel Pump Module Auxiliary	—	

Code	Name	Option	Location	Locator View	Connector End View
G13	Generator	—	In the engine compartment, right front, mounted to the right upper side of the engine		• • •
G13A	Auxiliary Generator	—	In the engine compartment, right front, mounted to the left lower side of the engine	—	• • • •
G18	Fuel Pump - High Pressure	—	Under hood, mounted to top rear of engine		
G24	Windshield Washer Pump	—	In the engine compartment, attached to the washer fluid reservoir, behind E13LA Front Headlamp - Left		
G33	Reductant Pump	L5P	Under the vehicle, left side, forward of rear axle, within reductant tank, part of A38 Reductant Tank Fluid Supply Pump Module	—	—
G73	Low Temperature Loop Coolant Pump	L5P	In the engine compartment, left front, attached to bracket near the front of the left lower control arm		
K4	Running Board Control Module	—	Underneath the vehicle, along the right frame rail, under the right rear door	—	• • •
K9	Body Control Module	—	In the passenger compartment, behind the driver side of the instrument panel, outboard of the steering column		• • • • • • • •
K17	Electronic Brake Control Module	—	In the engine compartment, left rear, mounted behind X50A Engine Wiring Harness Junction Block		
K20	Engine Control Module	—	In the engine compartment, left front, behind E13LA Front Headlamp - Left		• • • • • •
K29FV	Front Seat Heater Vent Control Module	KA1 / KQV	In the passenger compartment, right front, under the passenger seat cushion		• •
K32	Heated Steering Wheel Module	KI3	In the passenger compartment, in the steering wheel, behind the driver air bag		• •

Code	Name	Option	Location	Locator View	Connector End View
K36	Restraints Control Module	—	In the passenger compartment, bolted to the floor between the front seats or under console if equipped	• • • •	• •
K38	Chassis Control Module	—	Under the vehicle, mounted to the bracket above the spare tire	—	
K40D	Driver Seat Adjuster Memory Module	A45	In the passenger compartment, left front, mounted to the driver seat, beneath the front of the driver seat cushion		• • •
K43	Power Steering Control Module	—	Under the vehicle, part of the steering gear assembly		
K44	Power Takeoff Control Module	—	Under the vehicle, mounted to the left side frame rail, before transmission cross member support	—	• •
K56	Serial Data Gateway Module	—	In the passenger compartment, left front, between the instrument panel and bulkhead		• • •
K56U	Special Purpose Vehicle Control Module	KGU	In the passenger compartment, left front, between the instrument panel and bulkhead		
K60	Column Lock Module	BTM	In the passenger compartment, left front, mounted on top of the steering column, underneath instrument panel	• •	
K61	Sunroof Control Module	CF5	In the passenger compartment, front center, above headliner, rear of A103 Roof Console, forward of sunroof	—	
K67	Trailer Brake Control Module	JL1	Under the rear of the vehicle, right side, under the cargo box, above the right side of the spare tire		
K68	Trailer Lamp Control Module	UET	Under the rear of the vehicle, near spare tire		
K69	Transfer Case Control Module	NQF / NQH	In the engine compartment, left rear, left of K160 Brake System Control Module		• •
K71	Transmission Control Module	—	In the engine compartment, left front, behind left corner of the radiator		
K73	Telematic Control Module	UE1	In the passenger compartment, left front, between the instrument panel and bulkhead		• • •
K77	Remote Function Actuator Module	—	In the passenger compartment, right rear corner, below headliner	• •	

Code	Name	Option	Location	Locator View	Connector End View
K85P	Restraints Occupant Classification System Module - Passenger	—	In the passenger compartment, right front, mounted to the passenger seat, beneath the front of the right front seat cushion	—	
K111	Fuel Pump Power Control Module	—	Under the rear of vehicle, inboard of left frame rail		• • • • •
K115	Reductant Control Module	L5P	Under the vehicle, left side, in front of rear axle, mounted to the top of reductant tank	• •	
K157	Video Processing Module	UV2	In the passenger compartment, right rear, mounted behind the rear seat, below the rear window		• • • • • •
K182	Parking Assist Control Module	UD5 / UD7	In the passenger compartment, mounted to the driver side of the rear wall	• •	• • •
K194	Rear Gate Module	QT6	At the rear of the vehicle, inside of the endgate, behind trim panel, lower left side		
K214	Trailer Tire Pressure Indicator Module	UET	At the rear of the vehicle, mounted to the center of the rear bumper, near X88B Tow Vehicle Electrical Receptacle	• •	—
K219	Lighting Control Module	—	In the passenger compartment, within the instrument panel, left side, mounted in bracket to the left of K9 Body Control Module	—	• • • • •
K221LL	Headlamp LED Driver Module - Left Lower	—	At the left front of the vehicle, mounted to the rear of E13LA Front Headlamp - Left	—	
K221LU	Headlamp LED Driver Module - Left Upper	—	At the left front of the vehicle, mounted to the rear of E13LA Front Headlamp - Left	—	
K221RL	Headlamp LED Driver Module - Right Lower	—	At the right front of the vehicle, mounted to the rear of E13RA Front Headlamp - Right	—	
K221RU	Headlamp LED Driver Module - Right Upper	—	At the right front of the vehicle, mounted to the rear of E13RA Front Headlamp - Right	—	

Code	Name	Option	Location	Locator View	Connector End View
K234	Rear Seat Heater Vent Control Module	—	In the passenger compartment, under the left rear seat cushion		• •
M4P	Programmable Air Inlet Valve Actuator	—	In the passenger compartment, behind the instrument panel glove box	—	
M6PL	Programmable Temperature Valve Actuator - Left	—	In the passenger compartment, within the instrument panel, left of center, behind front floor console extension panel, mounted to the left side of the HVAC assembly	—	
M6PR	Programmable Temperature Valve Actuator - Right	—	In the passenger compartment, within the instrument panel, right of center, behind glove box, attached to the HVAC assembly	—	
M7	Automatic Transmission Shift Lock Control Solenoid	—	In the passenger compartment, right side of the steering wheel, attached to transmission shift lever	—	—
M8	Blower Motor	—	In the passenger compartment, under the right side of the instrument panel, above the hush panel	—	
M14A	Pickup Box Endgate Lock Actuator	QK1	At the rear of the vehicle, within the pickup box endgate, top center of endgate		
M26	Front Drive Axle Actuator	NQF / NQH	Under the vehicle, mounted to the front axle	—	
M37P	Programmable Mode Valve Actuator	—	In the passenger compartment, right front, within instrument panel, attached to HVAC assembly	—	
M50D	Front Seat Tilt Adjuster Actuator - Driver	—	In the passenger compartment, under the driver seat		
M50P	Front Seat Tilt Adjuster Actuator - Passenger	—	In the passenger compartment, under the passenger seat		
M51D	Front Seat Adjuster Actuator - Driver	—	In the passenger compartment, under the driver seat		
M51P	Front Seat Adjuster Actuator - Passenger	—	In the passenger compartment, under the passenger seat		
M53D	Front Seat Back Lumbar Motor - Driver	—	In the passenger compartment, in the center of the driver seat back	—	
M53P	Front Seat Back Lumbar Motor - Passenger	—	In the passenger compartment, right front, mounted inside of the passenger seat back		
M55D	Front Seat Vertical Adjuster Actuator - Driver	—	In the passenger compartment, under the driver seat		

Code	Name	Option	Location	Locator View	Connector End View
M55P	Front Seat Vertical Adjuster Actuator - Passenger	—	In the passenger compartment, under the passenger seat	• •	
M56D	Front Seat Recliner Actuator - Driver	—	In the passenger compartment, in the driver seat back		
M56P	Front Seat Recliner Actuator - Passenger	—	In the passenger compartment, in the passenger seat back		
M63	Rear Sliding Window Motor	A48	In the passenger compartment, mounted to the passenger side of the rear wall, behind the rear seat		
M64	Starter	—	In the engine compartment, left rear, mounted to rear of engine block	• •	• • • •
M72	Variable Power Steering Solenoid Valve	—	Under the vehicle, part of the steering gear assembly	—	—
M73A	Front Seat Back Ventilation Blower - Driver	KQV	In the passenger compartment, in the driver seat back		
M73B	Front Seat Back Ventilation Blower - Passenger	KQV	In the passenger compartment, in the passenger seat back		
M73D	Front Seat Cushion Ventilation Blower - Driver	KQV	In the passenger compartment, in the passenger seat cushion		
M73P	Front Seat Cushion Ventilation Blower - Passenger	KQV	In the passenger compartment, right front, mounted in the passenger seat cushion		
M74D	Front Side Door Window Regulator Motor - Driver	—	In the passenger compartment, in the driver door		
M74LR	Rear Side Door Window Regulator Motor - Left	Double Cab / Crew Cab	In the passenger compartment, in the left rear door		
M74P	Front Side Door Window Regulator Motor - Passenger	—	In the passenger compartment, in the passenger door		• •
M74RR	Rear Side Door Window Regulator Motor - Right	Double Cab / Crew Cab	In the passenger compartment, in the right rear door		
M75	Windshield Wiper Motor	—	Outside the vehicle, at the left rear of the engine compartment, below the left lower corner of the windshield		
M77D	Outside Rearview Mirror Actuator - Driver	—	Outside the vehicle, at the front of the driver door, within the A9A Outside Rearview Mirror - Driver	—	—

Code	Name	Option	Location	Locator View	Connector End View
M77P	Outside Rearview Mirror Actuator - Passenger	—	Outside the vehicle, at the front of the passenger door, within the A9B Outside Rearview Mirror - Passenger	—	—
M78D	Outside Rearview Mirror Folding Actuator - Driver	A45	Outside the vehicle, at the front of the driver door, within the A9A Outside Rearview Mirror - Driver	—	—
M78ED	Outside Rearview Mirror Extend Actuator - Driver	—	Outside the vehicle, at the front of the driver door, within the A9A Outside Rearview Mirror - Driver	—	—
M78EP	Outside Rearview Mirror Extend Actuator - Passenger	—	Outside the vehicle, at the front of the passenger door, within the A9B Outside Rearview Mirror - Passenger	—	—
M78P	Outside Rearview Mirror Folding Actuator - Passenger	A45	Outside the vehicle, at the front of the passenger door, within the A9B Outside Rearview Mirror - Passenger	—	—
M95L	Assist Step Motor - Left	BRS	Under the vehicle, along the left frame rail, under the driver door	—	—
M95R	Assist Step Motor - Right	BRS	Under the vehicle, along the right frame rail, under the passenger door	—	—
M96A	Active Grille Air Shutter Actuator 1	VTI	At the front of the vehicle, center, attached to the inside of the front grille		
M103	Turbocharger Vane Position Actuator	L5P	In the engine compartment, right side, mounted to turbocharger		
M104L	Parking Brake Actuator - Left	—	Under the vehicle, left rear, attached to the left rear brake caliper		
M104R	Parking Brake Actuator - Right	—	Under the vehicle, right rear, attached to the right rear brake caliper		
M125	Pickup Box Endgate Power Assist Actuator	QT6	Outside of the vehicle, within the endgate, lower right corner		
M151L	Pickup Box Endgate Cinch Latch Actuator - Left	QT6	At the rear of the vehicle, within endgate, on the left side		
M151R	Pickup Box Endgate Cinch Latch Actuator - Right	QT6	At the rear of the vehicle, within endgate, on the right side		
P3	Backup Alarm	8S3	Outside the vehicle, under rear frame rail	—	
P13	Horn	—	At the front of the vehicle, right side, mounted to the right front of the radiator core support		
P16	Instrument Panel Cluster Control Module	—	In the passenger compartment, in the driver side of the instrument panel		• •

Code	Name	Option	Location	Locator View	Connector End View
P19AFC	Front Floor Speaker - Console	—	In the passenger compartment, center, beneath floor console	• •	
P19AG	Radio Front Side Door Speaker - Left	—	In the passenger compartment, in the driver door		
P19AH	Radio Front Side Door Speaker - Right	—	In the passenger compartment, in the passenger door		
P19AL	Radio Rear Side Door Speaker - Left	—	In the passenger compartment, in the left rear door		
P19AM	Radio Rear Side Door Speaker - Right	—	In the passenger compartment, in the right rear door		
P19J	Radio Front Speaker - Instrument Panel Left	—	In the passenger compartment, in the top of the left side of the instrument panel	• •	• •
P19W	Radio Front Speaker - Instrument Panel Right	—	In the passenger compartment, in the top of the right side of the instrument panel	• •	• •
P29	Head-Up Display	UV6	In the passenger compartment, at the left side of the instrument panel, near the windshield	• •	• •
P34D	Side Object Detection Indicator - Driver	UKC	Outside of the vehicle, left side, part of E17D Outside Rearview Mirror Glass - Driver, within A9A Outside Rearview Mirror - Driver	—	—
P34P	Side Object Detection Indicator - Passenger	UKC	Outside of the vehicle, left side, part of E17P Outside Rearview Mirror Glass - Passenger, within A9B Outside Rearview Mirror - Passenger	—	—
P43	Forward Collision Alert Display	(UHX / UEU) - UV6	In the passenger compartment, in the top of the instrument panel, near the windshield, in front of the driver	• •	
P45L	Front Seat Lane Departure Warning Actuator - Left	—	In the passenger compartment, in the left side of the driver seat cushion		
P45R	Front Seat Lane Departure Warning Actuator - Right	—	In the passenger compartment, in the right side of the driver seat cushion		
P53	Driver Information Display	IOR	In the passenger compartment, at the center of the instrument panel, above S192 Radio Function Switch	—	• •
Q2	Air Conditioning Clutch	—	In the engine compartment, left front, part of G1 A/C Compressor		
Q5	Brake Pressure Modulator Valve	—	In the engine compartment, left rear, mounted behind X50A Engine Wiring Harness Junction Block	—	—

Code	Name	Option	Location	Locator View	Connector End View
Q6	Camshaft Position Actuator Solenoid Valve	L8T	In the engine compartment, front center, mounted to timing chain cover, above crankshaft harmonic balancer	—	
Q9R	Differential Locking Actuator - Rear	—	Under the vehicle, rear center, mounted to the top left side of the rear differential carrier	—	
Q12	Evaporative Emission Canister Purge Solenoid Valve	L8T	In the engine compartment, front center, mounted to intake manifold, to the left of Q38 Throttle Body		
Q13	Evaporative Emission Canister Vent Solenoid Valve	—	On the underbody, at the top left side of the fuel tank		
Q14	Exhaust Gas Recirculation Valve	L5P	In the engine compartment, right side, mounted above exhaust manifold	• •	
Q17A	Fuel Injector 1	—	• (L8T) In the engine compartment, underneath intake manifold, next to cylinder 1 intake port on the cylinder head • (L5P) In the engine compartment, center, mounted to valve cover above cylinder 1	• •	• •
Q17B	Fuel Injector 2	—	• (L8T) In the engine compartment, underneath intake manifold, next to cylinder 2 intake port on the cylinder head • (L5P) In the engine compartment, center, mounted to valve cover above cylinder 2	• •	• •
Q17C	Fuel Injector 3	—	• (L8T) In the engine compartment, underneath intake manifold, next to cylinder 3 intake port on the cylinder head • (L5P) In the engine compartment, center, mounted to valve cover above cylinder 3	• •	• •
Q17D	Fuel Injector 4	—	• (L8T) In the engine compartment, underneath intake manifold, next to cylinder 4 intake port on the cylinder head • (L5P) In the engine compartment, center, mounted to valve cover above cylinder 4	• •	• •

Code	Name	Option	Location	Locator View	Connector End View
Q17E	Fuel Injector 5	—	• (L8T) In the engine compartment, underneath intake manifold, next to cylinder 5 intake port on the cylinder head • (L5P) In the engine compartment, center, mounted to valve cover above cylinder 5	• • •	• •
Q17F	Fuel Injector 6	—	• (L8T) In the engine compartment, underneath intake manifold, next to cylinder 6 intake port on the cylinder head • (L5P) In the engine compartment, center, mounted to valve cover above cylinder 6	• •	• •
Q17G	Fuel Injector 7	—	• (L8T) In the engine compartment, underneath intake manifold, next to cylinder 7 intake port on the cylinder head • (L5P) In the engine compartment, center, mounted to valve cover above cylinder 7	• •	• •
Q17H	Fuel Injector 8	—	• (L8T) In the engine compartment, underneath intake manifold, next to cylinder 8 intake port on the cylinder head • (L5P) In the engine compartment, center, mounted to valve cover above cylinder 8	• •	• •
Q18A	Fuel Pressure Regulator 1	L5P	In the engine compartment, left rear side of engine, below Q18C Fuel Pressure Regulator 3, attached to G18 High Pressure Fuel Pump		
Q18B	Fuel Pressure Regulator 2	L5P	In the engine compartment, left side of engine, mounted to the left rear side of the valve cover		
Q20	Intake Airflow Control Valve	L5P	In the engine compartment, at the front of the engine, mounted to the intake manifold inlet		
Q32P	Shift Solenoid Valve - Power Take-Off	—	Under the vehicle, mounted to the left side frame rail	—	
Q38	Throttle Body	—	In the engine compartment, at the front of the engine, mounted to the intake manifold inlet	• •	
Q44	Engine Oil Pressure Control Solenoid Valve	—	In the engine compartment, at the front of the engine, behind the front cover	—	
Q46	Air Conditioning Compressor Solenoid Valve	—	In the engine compartment, left front, part of G1 A/C Compressor		

Code	Name	Option	Location	Locator View	Connector End View
Q47	Exhaust Gas Recirculation Cooler Bypass Solenoid Valve	—	In the engine compartment, right side, mounted on top of engine		
Q61	Reductant Fluid Injector	L5P	In the engine compartment, right front, mounted to the exhaust, in front of diesel particulate filter		
Q64	Evaporative Emission System Switching Valve	L8T	Under the vehicle, on top of primary fuel tank		
Q67	Exhaust Aftertreatment Fuel Injector	—	Under the vehicle, attached to the exhaust pipe, at the middle of the diesel particulate filter	—	• •
Q77A	Transmission Control Solenoid Valve 1	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q77B	Transmission Control Solenoid Valve 2	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q77C	Transmission Control Solenoid Valve 3	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q77D	Transmission Control Solenoid Valve 4	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q77E	Transmission Control Solenoid Valve 5	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q77F	Transmission Control Solenoid Valve 6	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q77G	Transmission Control Solenoid Valve 7	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q77H	Transmission Control Solenoid Valve 8	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q77J	Transmission Control Solenoid Valve 9	—	Under the vehicle, inside the T12 Automatic Transmission	—	
Q85	Cooling Fan Clutch	—	In the engine compartment, front of engine, attached to fan	—	
R6A	Terminating Resistor - High Speed Bus	UKL / (- UKC - UKV)	At the rear of the vehicle, attached to the inside of the rear bumper		
R12	Power Take-Off Switch Diode	—	In the passenger compartment, behind the middle of the instrument panel	—	—
R29	Fuel Filter	L5P	Under the vehicle, mounted to the inboard side of the left frame rail		
R55	Fuel Pump Module Diode	—	Under the vehicle, inside chassis harness, near K111 Fuel Pump Power Control Module	—	—

Code	Name	Option	Location	Locator View	Connector End View
S2	Automatic Transmission Manual Shift Shaft Position Switch	MQE	Underneath the vehicle, within T12 Automatic Transmission	—	—
S3	Automatic Transmission Control	—	In the passenger compartment, mounted to the steering column	—	
S3C	Automatic Transmission Control Lever	MHT / MQB / MQE	In the passenger compartment, left front, on the steering column shifter		
S13D	Door Lock Switch - Driver	—	In the passenger compartment, in the driver door handle trim panel	—	• •
S13P	Door Lock Switch - Passenger	—	In the passenger compartment, in the passenger door handle trim panel	—	• •
S25	Garage Door Opener Transmitter	—	In the passenger compartment, front center, part of A103 Roof Console	—	—
S27	Head-Up Display Switch	UV6	In the passenger compartment, left front, left of the steering column, in the instrument panel		
S30	Headlamp Switch	—	In the passenger compartment, left of the steering column, in the instrument panel		
S32R	Rear Seat Heater Switch	KA6	In the passenger compartment, center, on the rear of the floor console		
S33	Steering Wheel Horn Contact	—	In the passenger compartment, in the center of the steering wheel, behind the driver side air bag		• •
S38	On/Off Vehicle Switch	BTM	In the passenger compartment, right of the steering column, in the instrument panel	—	
S47D	Front Seat Adjuster Memory Switch - Driver	—	In the passenger compartment, left front, on the driver door panel forward of the inside driver door handle	—	
S51	Communication Center Call Switch	UE1	In the passenger compartment, part of the inside rearview mirror	—	—
S64D	Front Seat Adjuster Switch - Driver	—	In the passenger compartment, mounted to the outboard side of the driver seat cushion		• •
S64P	Front Seat Adjuster Switch - Passenger	—	In the passenger compartment, mounted to the outboard side of the passenger seat cushion	• •	
S65D	Front Seat Lumbar Switch - Driver	A2X	In the passenger compartment, mounted to the outboard side of the driver seat cushion		

Code	Name	Option	Location	Locator View	Connector End View
S65P	Front Seat Lumbar Switch - Passenger	A7K	In the passenger compartment, mounted to the outboard side of the passenger seat cushion	• •	
S70E	Radio Favorites Switch - Steering Wheel	—	In the passenger compartment, on the left rear side of the steering wheel	—	
S70F	Radio Volume Switch - Steering Wheel	—	In the passenger compartment, on the right rear side of the steering wheel	—	
S70L	Cruise Control Switch	—	In the passenger compartment, on the left side of the steering wheel		• •
S70R	Radio Control Switch - Steering Wheel	—	In the passenger compartment, on the right side of the steering wheel		
S76	Trailer Brake Control Switch	—	In the passenger compartment, center of the instrument panel, below S48C Multifunction Switch 1 - Instrument Panel		• •
S78	Turn Signal Switch	—	In the passenger compartment, on the left side of the steering column		
S79D	Front Side Door Window Control Switch - Driver	—	In the passenger compartment, behind the driver door trim panel, center of the door	—	• •
S79LR	Rear Side Door Window Switch - Left	—	In the passenger compartment, at the center of the left rear door, on the door trim panel		
S79P	Front Side Door Window Switch - Passenger	—	In the passenger compartment, on the passenger door trim panel, center of the door	—	• •
S79RR	Rear Side Door Window Switch - Right	—	In the passenger compartment, on the right rear door trim panel, center of the door		
S86	Vehicle Stability Control System Switch	—	In the passenger compartment, front center, attached to instrument panel, between S171L Instrument Panel Center Accessory Function Switch - Left and S171R Instrument Panel Center Accessory Function Switch - Right		
S91	Parking Brake Control Switch	—	In the passenger compartment, left front, mounted to the left side of the instrument panel bezel, left of S126 Ride Control Switch		
S126	Ride Control Switch	URC	In the passenger compartment, left front, left side of the instrument panel, left of the S30 Headlamp Switch		

Code	Name	Option	Location	Locator View	Connector End View
S158	Liftgate Exterior Release Switch - Auxiliary Endgate	—	At the rear of the vehicle, mounted to the rear of the pickup box endgate, top center of the endgate	—	
S159E	Liftgate Exterior Release Switch - Endgate	QT6 / QK2	Outside of the vehicle, at the rear of the vehicle, on the endgate	• •	
S171L	Instrument Panel Center Accessory Function Switch - Left	—	• (IOR) In the passenger compartment, mounted to the instrument panel, beneath A26 HVAC Controls, left switch bank • (IOK) In the passenger compartment, mounted to the instrument panel, beneath driver information display, left switch bank		
S171R	Instrument Panel Center Accessory Function Switch - Right	—	• (IOR) In the passenger compartment, mounted to the instrument panel, beneath A26 HVAC Controls, right switch bank • (IOK) In the passenger compartment, mounted to the instrument panel, beneath driver information display, right switch bank		
S172	Auxiliary Multifunction Switch	9L7	In the passenger compartment, mounted to the instrument panel	—	
S192	Radio Function Switch	IOR	In the passenger compartment, at the center of the instrument panel, below P53 Driver Information Display	—	
T1	DC/AC Converter Control Module	KI4 / KI5	In the passenger compartment, rear center, mounted to the rear wall	• • •	• •
T3	Audio Amplifier	UQA	In the rear passenger compartment, mounted behind the rear seat, below the rear window		• • •
T4M	Radio Antenna	—	Outside the vehicle, at the right rear of the hood		
T4P	High Frequency Antenna	—	Outside of the vehicle		• •
T4S	Wireless Communication Antenna - Bluetooth	—	Outside the vehicle, at the rear of the right front fender	—	—
T4TA	Auxiliary Wireless Communication Interface Antenna	—	In the passenger compartment, front center, below instrument panel upper trim panel, behind HVAC vent		
T8A	Ignition Coil 1	L8T	In the engine compartment, at the top of the engine, above cylinder 1		

Code	Name	Option	Location	Locator View	Connector End View
T8B	Ignition Coil 2	L8T	In the engine compartment, at the top of the engine, above cylinder 2		
T8C	Ignition Coil 3	L8T	In the engine compartment, at the top of the engine, above cylinder 3		
T8D	Ignition Coil 4	L8T	In the engine compartment, at the top of the engine, above cylinder 4		
T8E	Ignition Coil 5	L8T	In the engine compartment, at the top of the engine, above cylinder 5		
T8F	Ignition Coil 6	L8T	In the engine compartment, at the top of the engine, above cylinder 6		
T8G	Ignition Coil 7	L8T	In the engine compartment, at the top of the engine, above cylinder 7		
T8H	Ignition Coil 8	L8T	In the engine compartment, at the top of the engine, above cylinder 8		
T10G	Low Frequency Rear Bumper Antenna	—	At the rear of the vehicle, center, mounted to the inside of the rear bumper	• •	
T10J	Low Frequency Instrument Panel Antenna	(- D07)	In the passenger compartment, front center, within instrument panel, forward of radio control	—	
T10KA	Low Frequency Console Number 2 Antenna	D07	In the passenger compartment, center, inside the floor console, beneath the cupholders at the rear		
T10M	Low Frequency Front Side Door Outside Handle Antenna - Left	—	Outside of the vehicle, left side, within A24D Front Side Door Outside Handle - Left	—	—
T10N	Low Frequency Front Side Door Outside Handle Antenna - Right	—	Outside of the vehicle, right side, within A24P Front Side Door Outside Handle - Right	—	—
T10UA	Low Frequency Console Antenna	—	In the passenger compartment, under floor console	• •	• •
T12	Automatic Transmission	—	Under the vehicle, mounted to the rear of the engine		• • •
T22	Wireless Accessory Charging Module	K4C	In the passenger compartment, forward of center, in the floor console bin lid.		
W1	Blunt Cut - Camper/5th Wheel Provision	UY2	On the vehicle exterior, at the rear of the vehicle, left of the license plate	—	—
W11	Blunt Cut - Emergency Vehicle Roof Lamp	9L7	In the rear center, taped to the high mount stop lamp wiring harness	—	—
W24	Blunt Cut - Trailer Brakes Provision	Z82 - JL1	In the passenger compartment, under left side of the instrument panel	—	—

Code	Name	Option	Location	Locator View	Connector End View
W25	Blunt Cut - Configurable/ Accessory Relay	9L7	In the passenger compartment, under the instrument panel, left of the brake pedal	—	—
W30	Blunt Cut - Snow Plow	VYU	Accessory Package Component - Location on vehicle may vary per installation	—	—
X50A	Engine Wiring Harness Junction Block	—	In the engine compartment, left front, behind C1 Battery	• • •	*Electrical Center Identification Views 8-30*
X50B	Battery Distribution Engine Compartment Fuse Block	—	In the engine compartment, right rear, on top of wheel well	• •	*Electrical Center Identification Views 8-30*
X50EA	Battery Distribution Fuse Block - Auxiliary	—	In the engine compartment, left, on top of C1B Auxiliary Battery	—	*Electrical Center Identification Views 8-30*
X51AX	Instrument Panel Wiring Harness Junction Block - Auxiliary	9L7	In the passenger compartment, left front, within instrument panel, forward of driver trim panel	—	*Electrical Center Identification Views 8-30*
X51L	Instrument Panel Wiring Harness Junction Block - Left	—	In the passenger compartment, left side of the instrument panel, behind side trim panel	—	*Electrical Center Identification Views 8-30*
X51R	Instrument Panel Wiring Harness Junction Block - Right	—	In the passenger compartment, right side of the instrument panel, behind side trim panel		*Electrical Center Identification Views 8-30*
X53AF	Body Wiring Harness Junction Block	—	In the passenger compartment, left side of the instrument panel, behind the instrument panel fuse block access hole cover	—	*Electrical Center Identification Views 8-30*
X54	Accessory Wiring Junction Block - Snow Plow	—	Accessory Package Component - Location on vehicle may vary per installation	—	*Electrical Center Identification Views 8-30*
X55SP	Wiring Harness Fuse Holder - Snow Plow	VYU	Accessory Package Component - Location on vehicle may vary per installation	—	*Electrical Center Identification Views 8-30*
X80G	Accessory Power Receptacle - Instrument Panel	—	In the passenger compartment, front center, in the instrument panel, beneath A26 HVAC Controls	—	
X81ACA	Front Floor Console Accessory Power Rear Receptacle - 110V AC	KI4 and D07	In the passenger compartment, center, mounted to the rear of the floor console		
X81AI	Accessory Power Receptacle - Instrument Panel 110V AC	KI4 - AZ3 - D07	In the passenger compartment, front center, in the instrument panel, beneath S171R Instrument Panel Center Accessory Function Switch - Right	—	

Code	Name	Option	Location	Locator View	Connector End View
X81AP	Pickup Box Accessory Power Receptacle - 110V AC	KC9	Outside of the vehicle, right rear corner of the truck bed	—	
X81BCA	Front Floor Console Accessory Power Rear Receptacle - 220V AC	KI5 and D07	In the passenger compartment, center, mounted to the rear of the floor console	—	• •
X81BI	Accessory Power Receptacle - Instrument Panel 220V AC	KI4 - AZ3 - D07	In the passenger compartment, front center, in the instrument panel, beneath S171R Instrument Panel Center Accessory Function Switch - Right	—	
X81BP	Pickup Box Accessory Power Receptacle - 220V AC	KCA	Outside of the vehicle, right rear corner of the truck bed	—	
X81FSA	Accessory Power Receptacle - Front Center Seat Rear Cover 110V AC	AZ3 and KI4	In the passenger compartment, center, mounted to the lower rear portion of the front center seat		
X81FSB	Accessory Power Receptacle - Front Center Seat Rear Cover 220V AC	AZ3 and KI5	In the passenger compartment, center, mounted to the lower rear portion of the front center seat	—	
X83B	Audio/Video Receptacle	UBC	In the passenger compartment, front center, inside of the floor console bin, left front		• • •
X84	Data Link Connector	—	In the passenger compartment, at the bottom of the driver side of the instrument panel		
X85	Steering Wheel Airbag Coil	—	In the passenger compartment, behind the steering wheel		• •
X88B	Tow Vehicle Electrical Receptacle	—	At the rear of the vehicle, forward of the rear bumper fascia trailer hitch cover, to the left of the hitch		• • • • •
X88GB	Tow Vehicle Electrical Receptacle - 5th Wheel/Camper	Z6A	Rear of vehicle, mounted on left rear lower corner, of truck bed	—	
X92CD	Dual Charge Only Receptacle - Floor Console Rear	D07 and UBI	In the passenger compartment, center, mounted to the rear of the floor console		
X92FSR	Dual Charge Only Receptacle - Front Center Seat Rear Cover	AZ3 and UBI	In the passenger compartment, center, mounted to the lower rear portion of the front center seat		

Code	Name	Option	Location	Locator View	Connector End View
X92IP	USB 2 Port Receptacle - Instrument Panel	—	In the passenger compartment, front center of instrument panel, mounted to the right side of the instrument panel accessory bezel		• • • •
X122	Front View Camera Switch Wiring Harness to Body Wiring Harness	UV2	At the front of the vehicle, right side, between the right side of the radiator core support and E13RA Front Headlamp - Right		
X125	Body Wiring Harness to Engine Wiring Harness	—	In the engine compartment, left front, near air box	• • • •	
X128	Engine Wiring Harness to Camshaft Position Sensor Wiring harness	L8T	In the engine compartment, left front, near the front of the bank 1 cylinder head		
X129	Camshaft Position Sensor Wire to Oil Pump Flow Control Solenoid Valve Wire	L8T / L5P	Under the vehicle, in right front wheel well, near frame rail	—	
X135	Engine Wiring Harness to Battery Positive Cable	—	In the engine compartment, left side of engine compartment by battery		
X150	Front Object Alarm Sensor Wiring Harness to Body Wiring Harness	UKL	At the front of the vehicle, right side, between the lower right side of the radiator core support and E13RA Front Headlamp - Right	• •	
X160	Engine Wiring Harness to Fuel Injector Wiring Harness - Left	L8T	In the engine compartment, rear of the engine near the top center		
X161	Engine Wiring Harness to Fuel Injector Wiring Harness - Right	L8T	In the engine compartment, rear of the engine near the top right		
X175P	Engine Wiring Harness Chassis to PTO Harness	—	Under the vehicle, mounted to left front of transmission	—	
X176	Automatic Transmission Wiring Harness to Automatic Transmission Wiring Harness	—	Under the vehicle, inside the T12 Automatic Transmission	—	
X210	Instrument Panel Wiring Harness to Body Wiring Harness	—	In the passenger compartment, left front, behind the left front trim panel beneath the A-pillar	• •	
X211	Instrument Panel Wiring Harness to Body Wiring Harness	—	In the passenger compartment, right front, below passenger a-pillar, behind passenger trim panel	• • • •	

Code	Name	Option	Location	Locator View	Connector End View
X213	Auxiliary Fuse Block Wiring Harness to Instrument Panel Wiring Harness	—	In the passenger compartment, left front, behind the left side of instrument panel		
X217	Body Wiring Harness to Instrument Panel Wiring Harness	—	In the passenger compartment, right front, below passenger a-pillar, behind passenger trim panel	• • •	
X218	Instrument Panel Wiring Harness to Body Wiring Harness	—	In the passenger compartment, right front, below passenger a-pillar, behind passenger trim panel	• •	
X226	Front Floor Console Wiring Harness to Instrument Panel Wiring Harness	D07	In the passenger compartment, front center, beneath right front side of floor console	• •	
X227	Front Floor Console Wiring Harness to Body Wiring Harness	—	In the passenger compartment, center, beneath right rear of floor console	• • • • • •	• •
X237	Instrument Panel Wiring Harness to Instrument Panel Airbag Wiring Harness	—	In the passenger compartment, right front, within instrument panel, near right side of instrument panel tie bar	—	
X250	Instrument Panel Wiring Harness to Heater Wiring Harness	—	In the passenger compartment, above the gas pedal near the left side of the HVAC assembly		
X251	Auxiliary Heater Wiring Harness to Body Wiring Harness	C32	In the passenger compartment, right front, behind passenger front kick panel	• •	
X309A	Body Wiring Harness to Inside Rearview Mirror Wiring Harness	—	In the passenger compartment, left rear, above the headliner	• •	
X324	Body Wiring Harness to Body Rear Wiring Harness Extension Harness	KI5	In the passenger compartment, rear center, beneath rear window		
X331	Front Seat Wiring Harness - Driver to Body Wiring Harness	—	In the passenger compartment, left side, beneath driver seat	• • • • •	

Code	Name	Option	Location	Locator View	Connector End View
X336	Front Seat Wiring Harness - Passenger to Body Wiring Harness	—	In the passenger compartment, right side, beneath passenger seat	• • • • •	
X340	Body Wiring Harness to Rear Seat Heater Control Wiring Harness	KA6	In the passenger compartment, left rear, behind rear seat, beneath rear window	• • •	
X360	Chassis Wiring Harness to Fuel Pump Power Control Module Harness	—	Under the vehicle, near the fuel pump and level sensor assembly	—	
X370A	Dome Lamp Wiring Harness to Instrument Panel Wiring Harness	-GD2 / GD3 / GD5	In the passenger compartment, on top of the right side of the instrument panel under the top cover.	• •	
X370B	Dome Lamp Wiring Harness to Instrument Panel Wiring Harness	GF2 / GF3 / GF5	In the passenger compartment, on the right side of the instrument panel under the glovebox.	—	
X371A	Inside Rearview Mirror Wiring Harness to Dome Lamp Wiring Harness	—	In the passenger compartment, left rear, above the headliner		• •
X375	Sunroof Wiring Harness to Dome Lamp Wiring Harness	CF5	In the passenger compartment, front center, above headliner, above A103 Roof Console	—	
X382	Windshield Outside Moisture_Ambient Light and Humidity Sensor to Dome Lamp Wiring Harness	ASV	In the passenger compartment, front center, forward of A103 Roof Console		
X401	Chassis Wiring Harness to Engine Wiring Harness	L5P	In the engine compartment, left front, inboard of left frame rail, near engine cross member	• •	
X402A	Body Wiring Harness to Chassis Wiring Harness	UV2	In the engine compartment, behind left front wheel liner, rearward of suspension		
X402B	Body Wiring Harness to Chassis Wiring Harness	UV2	In the engine compartment, behind left front wheel liner, rearward of suspension		
X402C	Body Wiring Harness to Chassis Wiring Harness	—	In the engine compartment, behind left front wheel liner, rearward of suspension	• •	
X404	Chassis Wiring Harness to Emission Reduction Fluid Tank Reservoir Wire Harness	L5P	Under the vehicle, right rear, forward of rear axle, inboard of right frame rail		

Code	Name	Option	Location	Locator View	Connector End View
X410	Body Wiring Harness to Chassis Wiring Harness	—	In the engine compartment, top left side, rear of grounds on left side of body	• •	
X412	Assist Step Motor jumper to Chassis Wiring Harness	BRS	Under the vehicle, left rear, forward of left front leaf spring hanger, outboard of left frame rail		
X413	Assist Step Motor jumper to Chassis Wiring Harness	BRS	Under the vehicle, right rear, forward of right front leaf spring hanger, outboard of right frame rail	—	
X414	Chassis Rear Wiring Harness to Chassis Wiring Harness	KC9 / KCA	At the rear of the vehicle, right side, forward of rear bumper, inboard of right frame rail, rearward of frame cross member		
X415	Engine Wiring Harness to Transfer Case Selector Shift Control Switch Wiring Harness Extension Harness	NQF / NQH	In the engine compartment, lower left side of engine	• •	
X420A	Chassis Rear Wiring Harness Extension Harness to Chassis Wiring Harness	—	Under the rear of the vehicle, above rear differential attached to bracket that is mounted to frame cross member		
X420B	Chassis Rear Wiring Harness Extension Harness to Chassis Wiring Harness	—	Under the rear of the vehicle, above rear differential attached to bracket that is mounted to frame cross member		• •
X421A	Chassis Wiring Harness to Chassis Rear Wiring Harness Extension Harness	—	Under the vehicle, above the rear axle carrier assembly	—	
X421B	Chassis Wiring Harness to Chassis Rear Wiring Harness Extension Harness	—	Under the vehicle, above the rear axle carrier assembly	—	
X424	Body Wiring Harness to Chassis Wiring Harness	FHS	Under the vehicle, in the left front wheel well, on top of the left front strut tower	• •	
X426	Chassis Wiring Harness to Chassis Wiring Harness	—	In the engine compartment, mounted next to the battery		• •
X480	Chassis Wiring Harness to Trailer Rear Wiring Harness	—	At rear of vehicle, behind rear bumper		
X481	Trailer Rear Wiring Harness to Trailer Rear Wiring Harness	—	At rear of vehicle, behind rear bumper	—	

Code	Name	Option	Location	Locator View	Connector End View
X500	Front Side Door Door Wiring Harness - Left to Body Wiring Harness	—	In the passenger compartment, behind the left side of the instrument panel	• •	
X505	Front Side Door Door Wiring Harness - Left to Front Side Door Door Lock Door Wiring Harness - Left	—	In the driver door, behind the driver door panel		
X600	Front Side Door Door Wiring Harness - Right to Body Wiring Harness	—	In the passenger compartment, behind the right side of the instrument panel	• • •	
X605	Front Side Door Door Wiring Harness - Right to Front Side Door Door Lock Door Wiring Harness - Right	—	In the passenger door, behind the passenger door panel		
X630	Battery Positive Cable Extension Cable to Auxiliary Fuse Block Wiring Harness	9L7	In the passenger compartment, left front, within instrument panel, left side, taped to the instrument panel wiring harness	—	
X700	Rear Side Door Door Wiring Harness - Left to Body Wiring Harness	Double Cab / Crew Cab	In the passenger compartment, behind the left B-pillar, near the middle	• • •	
X800	Rear Side Door Door Wiring Harness - Right to Body Wiring Harness	Double Cab / Crew Cab	In the passenger compartment, behind the right B-pillar, near the middle	• •	
X850	Roof Wiring Harness to Instrument Panel Wiring Harness	—	In the passenger compartment, at the top of the left A pillar		
X910A	Tail Lamp Wiring Harness - Left to Chassis Wiring Harness	—	At the rear of the vehicle, left corner, underneath, on left frame rail		• •
X910C	Tail Lamp Wiring Harness - Left to Left Side Marker Lamp Harness	—	At the rear of the vehicle, left corner, underneath, on left frame rail	—	
X918	Endgate Wiring Harness to Chassis Wiring Harness	—	At the rear of the vehicle, left side, beneath truck bed, forward of endgate	• •	
X919	Endgate Wiring Harness to Chassis Wiring Harness	—	At the rear of the vehicle, left side, beneath truck bed, forward of endgate	• •	
X920A	Tail Lamp Wiring Harness - Right to Chassis Wiring Harness	—	At the rear of the vehicle, right corner, underneath, on right frame rail		• •

Code	Name	Option	Location	Locator View	Connector End View
X920C	Tail Lamp Wiring Harness - Right to Right Side Marker Lamp Harness	—	At the rear of the vehicle, right corner, underneath, on right frame rail	—	
X950	Rear Object Alarm Sensor Wiring Harness to Chassis Wiring Harness	—	At the rear of the vehicle, right side, forward of rear bumper, inboard of right frame rail, rearward of frame cross member	• •	
X950D	Engine Wiring Harness Chassis to Engine Wiring Harness	—	In the engine compartment, left front, top of the engine	• •	
X960A	Engine Wiring Harness to Engine Wiring Harness Extension	L5P	In the engine compartment, center, top of the engine		
X960B	Engine Wiring Harness to Engine Wiring Harness Extension	L5P	In the engine compartment, center, top of the engine		
X962	Engine Wiring Harness to Engine Coolant Temperature Sensor Harness	L8T	In the engine compartment, left front, near the top of the left rocker arm cover		
X977	Engine Wiring Harness to Accessory Wiring Harness	VYU	In the engine compartment, left front, near top of G13 Generator		
X985	Rearview Driver Information Camera Rear Closure Coaxial Cable to Inside Rearview Mirror Wiring Harness	—	In the passenger compartment, at the rear of the headliner	—	
G100	Auxiliary Battery Negative Cable	—	In the engine compartment, left front, attached to the inboard side of the left body structure	—	—
G103A	Body Wiring Harness	—	In the engine compartment, left front, attached to the inboard side of the left body structure		—
G103B	Body Wiring Harness	—	In the engine compartment, left front, attached to the inboard side of the left body structure		—
G104	Body Wiring Harness	—	In the engine compartment, right side, attached to the inboard side of the right body structure, rearward of X50A Engine Wiring Harness Junction Block		—
G105	Battery Negative Cable	—	In the engine compartment, right rear corner		—
G114	Engine Wiring Harness	—	In the engine compartment, mounted to engine, right front		—

Code	Name	Option	Location	Locator View	Connector End View
G131	Ground Strap	—	Under the vehicle, right front wheel well, behind inner fender, rearward of upper control arm		—
G132	Ground Strap	—	Under the vehicle, right front wheel well, behind inner fender, rearward of lower control arm		—
G133	Ground Strap	—	Under the vehicle, right front wheel well, behind inner fender, rearward of upper control arm		—
G134	Ground Strap	—	Under the vehicle, right front wheel well, behind inner fender, rearward of lower control arm	• •	—
G175L	Engine Wiring Harness	L8T	In the engine compartment, mounted to the rear of left cylinder head		—
G176R	Engine Wiring Harness	L8T	In the engine compartment, mounted to the rear of right cylinder head		—
G177B	Engine Wiring Harness	—	In the engine compartment, right rear, mounted to engine block	• •	—
G200	Instrument Panel Wiring Harness	—	In the passenger compartment, left front, below A-pillar, behind driver side kick panel		—
G201	Instrument Panel Wiring Harness	—	In the passenger compartment, left front, behind driver front kick panel, beneath driver side A-pillar		—
G202	Air Heater Ground Wiring Harness	C32	In the passenger compartment, right front, behind passenger front kick panel		—
G203	Air Heater Ground Wiring Harness	C32	In the passenger compartment, left front, behind driver front kick panel, beneath driver side A-pillar		—
G300A	Body Wiring Harness	—	In the passenger compartment, right side, at the base of the B-pillar		—
G300B	Body Wiring Harness	—	In the passenger compartment, right side, at the base of the B-pillar		—
G301A	Body Wiring Harness	—	In the passenger compartment, left side, at the base of the left B-Pillar		—
G301B	Body Wiring Harness	—	In the passenger compartment, left side, at the base of the left B-Pillar		—
G303	Body Wiring Harness	—	In the passenger compartment, left side, attached to the body beneath the driver seat		—

Code	Name	Option	Location	Locator View	Connector End View
G402	Chassis Wiring Harness	—	Under the vehicle, left side, attached at the rear of the left front body mount		—
G404	Chassis Wiring Harness	—	Under the rear of the vehicle, forward of the hitch and endgate, attached to the rear of the frame cross member, furthest right of the 3 grounds		—
G406A	Chassis Wiring Harness	—	Under the rear of the vehicle, forward of the hitch and endgate, attached to the rear of the frame cross member, middle of the 3 grounds		—
G406B	Chassis Wiring Harness	—	Under the rear of the vehicle, forward of the hitch and endgate, attached to the rear of the frame cross member, middle of the 3 grounds		—
G407	Chassis Wiring Harness	—	Under the rear of the vehicle, forward of the hitch and endgate, attached to the rear of the frame cross member, furthest left of the 3 grounds		—
J100	Engine Wiring Harness	L8T	In the engine compartment, left lower side, on harness before branch to X50A Engine Wiring Harness Junction Block X3	• •	—
J101	Engine Wiring Harness	L8T	In the engine compartment, left lower side, on harness before branch to X50A Engine Wiring Harness Junction Block X3	• •	—
J102	Engine Wiring Harness	L8T	In the engine compartment, left lower side, in channel near breakout to B68A Knock Sensor 1		—
J103	Engine Wiring Harness	L8T	In the engine compartment, near breakout to Q12 Evaporative Emission Canister Purge Solenoid Valve		—
J104	Engine Wiring Harness	L8T	In the engine compartment, near breakout to Q12 Evaporative Emission Canister Purge Solenoid Valve		—
J105	Engine Wiring Harness	L8T	In the engine compartment, near breakout to Q38 Throttle Body	• •	—
J106	Engine Wiring Harness	L8T	In the engine compartment, near breakout to connector X160		—
J107	Engine Wiring Harness	L8T	In the engine compartment, near breakout to connector X160		—
J108	Engine Wiring Harness	L8T	In the engine compartment, near breakout to ground G175L	• •	—

Code	Name	Option	Location	Locator View	Connector End View
J109	Engine Wiring Harness	L8T	In the engine compartment, near breakout to ground G175L		—
J110	Engine Wiring Harness	—	• (L8T) In the engine compartment, left lower side, in channel near breakout to B68A Knock Sensor 1 • (L5P) In the engine compartment, between breakout to connector X112 and breakout to B195A Nitrogen Oxides Sensor 1		—
J111	Engine Wiring Harness	—	• (L8T) In the engine compartment, top rear of engine, near breakout to X962 • (L5P) In the engine compartment, near breakout to B193A Charge Air Cooler Air Temperature Sensor - Inlet	• •	—
J112	Engine Wiring Harness	—	• (L8T) In the engine compartment, left side, before breakout to underhood fuse block • (L5P) In the engine compartment, left side, after branch to breakout to X145	• •	—
J113	Engine Wiring Harness	L5P	In the engine compartment, front, in harness near connector X950D		—
J114	Engine Wiring Harness	L5P	In the engine compartment, near breakout to B193A Charge Air Cooler Air Temperature Sensor - Inlet		—
J115	Engine Wiring Harness	L5P	In the engine compartment, near breakout to M103 Turbocharger Vane Position Actuator		—
J116	Engine Wiring Harness	L5P	In the engine compartment, near breakout to B65 Manifold Absolute Pressure and Intake Air Temperature Sensor		—
J117	PTO Wiring Harness	—	Under the vehicle, near Q32P Shift Solenoid Valve - Power Take-Off		—
J118	Engine Wiring Harness	L5P	In the engine compartment, near breakout to X401		—
J119	Engine Wiring Harness Chassis	PTO	In the engine compartment, near breakout to X401		—
J120	Engine Wiring Harness	L5P	In the engine compartment, near breakout to X145		—
J121	Engine Wiring Harness	L5P	In the engine compartment, near breakout to X145		—
J122	Engine Wiring Harness	L5P	In the engine compartment, near breakout to X145		—

Code	Name	Option	Location	Locator View	Connector End View
J123	Engine Wiring Harness	L5P	In the engine compartment, near breakout to X50A Engine Wiring Harness Junction Block X3		—
J124	Engine Wiring Harness	L5P	In the engine compartment, left side of engine near bell housing		—
J126	Front Object Alarm Sensor Wiring Harness	—	In the engine compartment, left rear, near breakout to B306C Parking Assist Alarm Sensor - Front Right Middle		—
J127	Front Object Alarm Sensor Wiring Harness	—	At the front of the vehicle, attached to the inside of the front bumper, between breakout to B306B Parking Assist Alarm Sensor - Front Left Middle and breakout to B306C Parking Assist Alarm Sensor - Front Right Middle		—
J128	Automatic Transmission Wiring Harness	—	Under the vehicle, within the automatic transmission assembly	—	—
J129	Front Object Alarm Sensor Wiring Harness	—	At the front of the vehicle, attached to the inside of the front bumper, between breakout to B306B Parking Assist Alarm Sensor - Front Left Middle and breakout to B306C Parking Assist Alarm Sensor - Front Right Middle		—
J130	Snow Plow Wiring Harness	VYU	In the engine compartment, near, breakout to G13A Auxiliary Generator	—	—
J131	Snow Plow Wiring Harness	VYU	In the engine compartment, right front, between X55SP Fuse Holder - Snow Plow and KR181 Snow Plow Relay	—	—
J132	Front Object Alarm Sensor Wiring Harness	—	At the front of the vehicle, attached to the inside of the front bumper, between breakout to B306B Parking Assist Alarm Sensor - Front Left Middle and breakout to B306C Parking Assist Alarm Sensor - Front Right Middle		—
J175	Automatic Transmission Wiring Harness	—	Under the vehicle, within the automatic transmission assembly	—	—
J176	Automatic Transmission Wiring Harness	—	Under the vehicle, within the automatic transmission assembly	—	—
J178	Automatic Transmission Wiring Harness	—	Under the vehicle, within the automatic transmission assembly	—	—
J179	Automatic Transmission Wiring Harness	—	Under the vehicle, within the automatic transmission assembly	—	—

Code	Name	Option	Location	Locator View	Connector End View
J180	Front Headlamp - Left	T4A	Front of vehicle, inside of left headlamp assembly	—	—
J181	Front Headlamp - Right	T4A	Front of vehicle, inside of right headlamp assembly	—	—
J182	Front Headlamp - Left	T4A	Front of vehicle, inside of left headlamp assembly	—	—
J183	Front Headlamp - Right	T4A	Front of vehicle, inside of right headlamp assembly	—	—
J184	Positive Auxiliary Battery Harness	K4Z	In the engine compartment, right under auxiliary battery	—	—
J200	Instrument Panel Wiring Harness	—	In the passenger compartment, in breakout to K9 Body Control Module		—
J201	Instrument Panel Wiring Harness	—	In the passenger compartment, in breakout to K9 Body Control Module		—
J202	Instrument Panel Wiring Harness	—	In the passenger compartment, in breakout to K9 Body Control Module		—
J203	Instrument Panel Wiring Harness	URC	In the passenger compartment, in breakout to X84 Data Link Connector	—	—
J204	Instrument Panel Wiring Harness	—	In the passenger compartment, near breakout to X84 Data Link Connector		—
J205	Instrument Panel Wiring Harness	—	In the passenger compartment, near breakout to P19J Radio Front Speaker - Instrument Panel Left	• •	—
J206	Instrument Panel Wiring Harness	—	In the passenger compartment, between breakout to P43 Forward Collision Alert Display and breakout to K60 Column Lock Module		—
J207	Instrument Panel Wiring Harness	—	In the passenger compartment, between breakout to P43 Forward Collision Alert Display and breakout to K60 Column Lock Module	• •	—
J208	Instrument Panel Wiring Harness	—	In the passenger compartment, in breakout to K60 Column Lock Module		—
J209	Instrument Panel Wiring Harness	—	In the passenger compartment, between breakout to B10D Sun Load and Ambient Light and Security Indicator Sensor and breakout to K60 Column Lock Module	• • •	—
J210	Instrument Panel Wiring Harness	—	In the passenger compartment, between breakout to B10D Sun Load and Ambient Light and Security Indicator Sensor and breakout to K60 Column Lock Module	• •	—

Code	Name	Option	Location	Locator View	Connector End View
J211	Instrument Panel Wiring Harness	—	In the passenger compartment, between breakout to B10D Sun Load and Ambient Light and Security Indicator Sensor and breakout to K60 Column Lock Module		—
J212	Instrument Panel Wiring Harness	—	In the passenger compartment, front center, within instrument panel, approximately 12 cm (4.68 in) from breakout to T4TA Auxiliary Wireless Communication Interface Antenna		—
J213	Instrument Panel Wiring Harness	—	In the passenger compartment, front center, within instrument panel, approximately 12 cm (4.68 in) from breakout to P19W Radio Front Speaker - Instrument Panel Right		—
J214	Instrument Panel Wiring Harness	—	In the passenger compartment, front center, within instrument panel, approximately 11 cm (4.29 in) from X51R Instrument Panel Wiring Harness Junction Block - Right	—	—
J215	Instrument Panel Wiring Harness	—	In the passenger compartment, front center, within instrument panel, approximately 5 cm (1.95 in) from breakout to M8 Blower Motor		—
J216	Heater Wiring Harness	—	In the passenger compartment, front center, within instrument panel, approximately 18 cm (7.02 in) from connector X250	—	—
J217	Heater Wiring Harness	—	In the passenger compartment, front center, within instrument panel, approximately 42 cm (16.38 in) from connector X250	—	—
J218	Heater Wiring Harness	—	In the passenger compartment, front center, within instrument panel, approximately 30 cm (11.7 in) from connector X250	—	—
J219	Steering Wheel Horn Switch Wiring Harness	—	In the passenger compartment, left front, within steering wheel	—	—
J222	Steering Wheel Horn Switch Wiring Harness	—	In the passenger compartment, left front, within steering wheel	—	—
J300	Body Wiring Harness	—	In the passenger compartment, approximately 10 cm (3.9 in) from breakout to E13LA Front Headlamp - Left	• •	—

Code	Name	Option	Location	Locator View	Connector End View
J301	Body Wiring Harness	—	In the passenger compartment, in breakout to X50A Engine Wiring Harness Junction Block X1	• •	—
J302	Body Wiring Harness	—	In the passenger compartment, approximately 15 cm (5.85 in) from breakout to B22 Brake Pedal Position Sensor	• • •	—
J303	Body Wiring Harness	—	In the passenger compartment, approximately 14 cm (5.46 in) from breakout to B22 Brake Pedal Position Sensor	• • •	—
J304	Body Wiring Harness	—	In the passenger compartment, approximately 23 cm (8.97 in) from breakout to B107 Accelerator Pedal Position Sensor	• • •	—
J305	Body Wiring Harness	—	In the passenger compartment, approximately 20 cm (7.8 in) from breakout to B107 Accelerator Pedal Position Sensor	• • •	—
J306	Body Wiring Harness	—	In the passenger compartment, approximately 16 cm (6.24 in) from breakout to B107 Accelerator Pedal Position Sensor	• • •	—
J307	Body Wiring Harness	—	In the passenger compartment, approximately 12 cm (4.68 in) from breakout to B107 Accelerator Pedal Position Sensor	• • •	—
J308	Body Wiring Harness	—	In the passenger compartment, approximately 18 cm (7.02 in) from breakout to B22 Brake Pedal Position Sensor	• •	—
J309	Body Wiring Harness	—	In the passenger compartment, in breakout to X53AF Body Wiring Harness Junction Block		—
J310	Body Wiring Harness	—	In the passenger compartment, approximately 40 cm (15.6 in) from breakout to Connector X210	• •	—
J311	Body Wiring Harness	—	In the passenger compartment, approximately 42 cm (16.38 in) from breakout to Connector X210	• •	—

Code	Name	Option	Location	Locator View	Connector End View
J312	Body Wiring Harness	—	In the passenger compartment, approximately 44 cm (17.16 in) from breakout to Connector X210	• •	—
J313	Body Wiring Harness	—	In the passenger compartment, approximately 12 cm (4.68 in) from breakout to K36 Restraints Control Module X2	• • • •	—
J314	Body Wiring Harness	—	In the passenger compartment, approximately 32 cm (12.48 in) from breakout to K36 Restraints Control Module X1	• • • •	—
J315	Body Wiring Harness	—	In the passenger compartment, approximately 23 cm (8.97 in) from breakout to G303	• • • •	—
J318	Body Wiring Harness	—	In the passenger compartment, approximately 10 cm (3.9 in) from breakout to B58R Airbag Front End Discriminating Sensor - Right		—
J319	Body Wiring Harness	—	In the passenger compartment, approximately 26 cm (10.14 in) from breakout to right bulkhead passthrough grommet	• • •	—
J320	Body Wiring Harness	—	In the passenger compartment, approximately 44 cm (17.16 in) from breakout to right bulkhead passthrough grommet	• • •	—
J321	Body Wiring Harness	—	In the passenger compartment, approximately 54 cm (21.06 in) from breakout to right bulkhead passthrough grommet	• • •	—
J322	Body Wiring Harness	—	In the passenger compartment, approximately 30 cm (11.7 in) from breakout to B107 Accelerator Pedal Position Sensor	• • •	—
J323	Body Wiring Harness	—	In the passenger compartment, right side, approximately 30 cm (11.7 in) from breakout to connector X336	• •	—
J325	Body Wiring Harness	—	In the passenger compartment, center, approximately 3 cm (1.17 in) from breakout to connector X227	• • • •	—

Code	Name	Option	Location	Locator View	Connector End View
J326	Body Wiring Harness	—	In the passenger compartment, in breakout to M75 Windshield Wiper Motor	• • •	—
J327	Body Wiring Harness	—	In the passenger compartment, right side, approximately 86 cm (33.54 in) from breakout to connector X210	• •	—
J328	Body Wiring Harness	—	In the passenger compartment, in breakout to X53AF Body Wiring Harness Junction Block		—
J329	Body Wiring Harness	—	In the passenger compartment, approximately 27 cm (10.53 in) from breakout to left bulkhead passthrough grommet	• •	—
J330	Body Wiring Harness	—	In the passenger compartment, left side, approximately 27 cm (10.53 in) from breakout to X331	• • •	—
J331	Body Wiring Harness	—	In the passenger compartment, left side, approximately 10 cm (3.9 in) from breakout to X331	• • •	—
J332	Body Wiring Harness	—	In the passenger compartment, right side, under right front door sill plate		—
J333	Body Wiring Harness	—	In the passenger compartment, center, approximately 14 cm (5.46 in) from breakout to connector X227	• • •	—
J334	Body Wiring Harness	—	In the passenger compartment, center, approximately 13 cm (5.07 in) from breakout to connector X227	• • •	—
J336	Body Wiring Harness	—	In the passenger compartment, left side, approximately 5 cm (1.95 in) from crossover bundle	• • •	—
J337	Front Floor Console Wiring Harness	—	In the passenger compartment, center, approximately 5 cm (1.95 in) from breakout to T22 Wireless Accessory Charging Module		—
J339	Front Floor Console Wiring Harness	—	In the passenger compartment, center, approximately 36 cm (14.04 in) from breakout to T10KA Low Frequency Console Number 2 Antenna		—

Code	Name	Option	Location	Locator View	Connector End View
J340	Chassis Wiring Harness	—	• (Pickup) Under the vehicle, left, approximately 21 cm (8.19 in) from breakout to G402 • (Chassis Cab) Under the vehicle, left side, approximately 12 cm (4.68 in) from breakout to connector X401		—
J341	Chassis Wiring Harness	—	• (Pickup) Under the vehicle, center crossover bundle, approximately 85 cm (33.15 in) from left side breakout • (Chassis Cab) Under the vehicle, left side, approximately 24 cm (9.36 in) from breakout to G402		—
J342	Chassis Wiring Harness	—	• (Pickup) Under the vehicle, center crossover bundle, approximately 55 cm (21.45 in) from left side breakout • (Chassis Cab) Under the vehicle, left side, approximately 80 cm (31.2 in) from breakout to G402		—
J344	Chassis Wiring Harness	L5P	• (Pickup) Under the vehicle, right side, approximately 10 cm (3.9 in) from breakout to B345P Exhaust Pressure Differential Sensor - Particulate Filter • (Chassis Cab) Under the vehicle, left side, approximately 12 cm (4.68 in) from breakout to G407		—
J345	Chassis Wiring Harness	—	• (Pickup) Under the vehicle, left, forward approximately 50 cm (19.5 in) from crossover bundle • (Chassis Cab) Under the vehicle, left side, approximately 43 cm (16.77 in) from breakout to connector X404	• •	—
J347	Chassis Wiring Harness	L5P	• (Pickup) Under the vehicle, left side, approximately 21 cm (8.19 in) rearward from crossover bundle • (Chassis Cab) Under the vehicle, left side, approximately 51 cm (19.89 in) from breakout to K111 Fuel Pump Power Control Module		—

Code	Name	Option	Location	Locator View	Connector End View
J348	Chassis Wiring Harness	—	• (Pickup) Under the vehicle, left side, approximately 7 cm (2.73 in) from breakout to G407 • (Chassis Cab) Under the vehicle, left side, approximately 6 cm (2.34 in) from breakout to connector X910A		—
J349	Chassis Wiring Harness	—	• (Pickup) Under the vehicle, left side, near breakout to K38 Chassis Control Module • (Chassis Cab) Under the vehicle, left side, near breakout to connector X910A		—
J350	Chassis Wiring Harness	L5P	• (Pickup) Under the vehicle, left side, approximately 15 cm (5.85 in) from breakout to B47 Fuel Pressure Sensor • (Chassis Cab) Under the vehicle, left side, in breakout to B136 Exhaust Particulate Matter Sensor		—
J351	Chassis Wiring Harness	—	• (Pickup) Under the vehicle, left side, between breakout to G402 and breakout to connector X412 • (Chassis Cab) Under the vehicle, left side, in breakout to B136 Exhaust Particulate Matter Sensor		—
J352	Chassis Wiring Harness	—	(Pickup) Under the vehicle, left side, approximately 5 cm (1.95 in) from breakout to connector X424		—
J353	Chassis Wiring Harness	—	• (Pickup) Under the vehicle, left side, approximately 18 cm (7.02 in) from breakout to connector X424 • (Chassis Cab) Under the vehicle, left side, approximately 25 cm (9.75 in) from breakout to B47 Fuel Pressure Sensor		—
J354	Chassis Wiring Harness	FHS	(Pickup) Under the vehicle, left, approximately 24 cm (9.36 in) from breakout to G402		—
J355	Chassis Wiring Harness	—	(Pickup) Under the vehicle, left side, rearward of breakout to connector X404		—
J356	Chassis Wiring Harness	—	(Pickup) Under the vehicle, left side, rearward of breakout to connector X404		—

Code	Name	Option	Location	Locator View	Connector End View
J357	Chassis Wiring Harness	—	(Pickup) Under the vehicle, left, forward approximately 28 cm (10.92 in) from breakout to K111 Fuel Pump Power Control Module		—
J358	Chassis Wiring Harness	BRS	(Pickup) Under the vehicle, left, forward approximately 20 cm (7.8 in) from breakout to K111 Fuel Pump Power Control Module		—
J359	Chassis Wiring Harness	—	(Pickup) Under the vehicle, left, forward approximately 15 cm (5.85 in) from breakout to K111 Fuel Pump Power Control Module		—
J360	Chassis Wiring Harness	—	(Pickup) Under the vehicle, left, forward approximately 10 cm (3.9 in) from breakout to K111 Fuel Pump Power Control Module		—
J361	Chassis Wiring Harness	—	(Pickup) Under the vehicle, left, forward approximately 5 cm (1.95 in) from breakout to K111 Fuel Pump Power Control Module		—
J362	Chassis Wiring Harness	—	(Pickup) Under the vehicle, left, forward approximately 20 cm (7.8 in) from breakout to connector X910A		—
J363	Dome Lamp Wiring Harness	—	In the passenger compartment, right, top of right A pillar channel		—
J364	Dome Lamp Wiring Harness	—	In the passenger compartment, right, top of right A pillar channel		—
J365	Dome Lamp Wiring Harness	—	In the passenger compartment, right side, near breakout to E31R Sunshade Mirror Lamp - Right		—
J366	Dome Lamp Wiring Harness	—	In the passenger compartment, right side, between breakout to E31R Sunshade Mirror Lamp - Right and breakout to B24RF Mobile Telephone Microphone - Right Front		—
J367	Dome Lamp Wiring Harness	—	In the passenger compartment, right side, between breakout to B24RF Mobile Telephone Microphone - Right Front and breakout to A103 Roof Console		—

Code	Name	Option	Location	Locator View	Connector End View
J368	Dome Lamp Wiring Harness	—	In the passenger compartment, right side, between breakout to B24RF Mobile Telephone Microphone - Right Front and breakout to A103 Roof Console		—
J369	Front Seat Wiring Harness - Center	AZ3	In the passenger compartment, center, between breakout to X81FSA Accessory Power Receptacle - Front Center Seat Rear Cover 110V AC and connector X227		—
J371	Front Seat Wiring Harness - Driver	—	In the passenger compartment, driver seat, approximately 2 cm (0.78 in) from breakout to M73D Front Seat Cushion Ventilation Blower - Driver		—
J372	Front Seat Wiring Harness - Driver	—	In the passenger compartment, driver seat, approximately 5 cm (1.95 in) from breakout to M73D Front Seat Cushion Ventilation Blower - Driver		—
J373	Front Seat Wiring Harness - Driver	—	In the passenger compartment, driver seat, approximately 3 cm (1.17 in) from breakout to M50D Front Seat Tilt Adjuster Actuator - Driver		—
J374	Front Seat Wiring Harness - Driver	—	In the passenger compartment, driver seat, approximately 3 cm (1.17 in) from breakout to E14B Front Seat Cushion Heater - Driver	—	—
J375	Front Seat Wiring Harness - Driver	—	In the passenger compartment, driver seat, approximately 5 cm (1.95 in) from breakout to E14B Front Seat Cushion Heater - Driver		—
J376	Front Seat Wiring Harness - Driver	—	In the passenger compartment, driver seat, approximately 7 cm (2.73 in) from breakout to P45R Front Seat Lame Departure Warning Actuator - Right		—
J377	Front Seat Wiring Harness - Passenger	—	In the passenger compartment, passenger seat, approximately 8 cm (3.12 in) from breakout to M73P Front Seat Cushion Ventilation Blower - Passenger		—
J378	Front Seat Wiring Harness - Passenger	—	In the passenger compartment, passenger seat, approximately 11 cm (4.29 in) from breakout to K29FV Front Seat Heater Vent Control Module		—

Code	Name	Option	Location	Locator View	Connector End View
J379	Front Seat Wiring Harness - Passenger	—	In the passenger compartment, passenger seat harness		—
J380	Front Seat Wiring Harness - Passenger	—	In the passenger compartment, passenger seat harness		—
J383	Roof Wiring Harness	—	In the passenger compartment, roof, approximately 20 cm (7.8 in) from connector X850	—	—
J384	Roof Wiring Harness	—	In the passenger compartment, roof, approximately 50 cm (19.5 in) from E3E Front Clearance Lamp - Roof Right Outer	—	—
J385	Body Wiring Harness	—	In the passenger compartment, approximately 48 cm (18.72 in) from breakout to right bulkhead passthrough grommet	• •	—
J387	Front Floor Console Wiring Harness	—	In the passenger compartment, center, approximately 14 cm (5.46 in) from connector X227	—	—
J388	Rear Seat Heater Control Wiring Harness	—	In the passenger compartment, rear seat, approximately 7 cm (2.73 in) from K234 Rear Seat Heater Vent Control Module		—
J402	Trailer Rear Wiring Harness	UY2 / Z6A	In trailer harness, approximately 22 cm (8.58 in) from X88B Tow Vehicle Electrical Receptacle	—	—
J403	Trailer Rear Wiring Harness	UY2 / Z6A	In trailer harness, approximately 15 cm (5.85 in) from X88B Tow Vehicle Electrical Receptacle	—	—
J404	Trailer Rear Wiring Harness	UY2 / Z6A	In trailer harness, approximately 8 cm (3.12 in) from X88B Tow Vehicle Electrical Receptacle	—	—
J405	Trailer Rear Wiring Harness	UY2 / Z6A	In trailer harness, approximately 30 cm (11.7 in) from X88B Tow Vehicle Electrical Receptacle	—	—
J406	Trailer Rear Wiring Harness	UY2 / Z6A	In trailer harness, approximately 7 cm (2.73 in) from X88B Tow Vehicle Electrical Receptacle	—	—
J407	Trailer Rear Wiring Harness	UY2 / Z6A	In trailer harness, approximately 23 cm (8.97 in) from X88B Tow Vehicle Electrical Receptacle	—	—
J480	Backup Alarm Wiring Harness	8S3	In the backup alarm wiring harness, approximately 11 cm (4.29 in) into breakout for P3 Backup Alarm	—	—

Code	Name	Option	Location	Locator View	Connector End View
J481	Backup Alarm Wiring Harness	8S3	In the backup alarm wiring harness, approximately 16 cm (6.24 in) into breakout for P3 Backup Alarm	—	—
J500	Front Side Door Door Wiring Harness - Driver	—	In the driver front door, approximately 8 cm (3.12 in) from breakout to P19AG Radio Front Side Door Speaker - Left	—	—
J501	Front Side Door Door Wiring Harness - Driver	—	In the driver front door, approximately 12 cm (4.68 in) from breakout to B63LF Airbag Side Impact Sensor - Left Front Door		—
J502	Front Side Door Door Wiring Harness - Driver	—	In the driver front door, approximately 15 cm (5.85 in) from breakout to A24D Front Side Door Outside Handle - Left	—	—
J550	Front Side Door Door Lock Door Wiring Harness - Left	—	In the driver front door, in breakout to S79D Front Side Door Window Control Switch - Driver	—	—
J551	Outside Rearview Mirror - Driver	—	In the driver outside rearview mirror	—	—
J600	Front Side Door Door Wiring Harness - Passenger	—	In the passenger front door, between breakout to B63RF Airbag Side Impact Sensor - Right Front Door and breakout to A24P Front Side Door Outside Handle - Right	—	—
J601	Front Side Door Door Wiring Harness - Passenger	—	In the passenger front door, between breakout to B63RF Airbag Side Impact Sensor - Right Front Door and breakout to P19AH Radio Front Side Door Speaker - Right		—
J602	Front Side Door Door Wiring Harness - Passenger	—	In the passenger front door, between breakout to B63RF Airbag Side Impact Sensor - Right Front Door and breakout to P19AH Radio Front Side Door Speaker - Right		—
J650	Front Side Door Door Lock Door Wiring Harness - Right	—	In the driver front door, in breakout to S79P Front Side Door Window Switch - Passenger	—	—
J651	Outside Rearview Mirror - Passenger	—	In the passenger outside rearview mirror	—	—
J700	Rear Side Door Door Wiring Harness - Left	—	In the left rear door, between breakout to M74LR Rear Side Door Window Regulator Motor - Left and breakout to B63LR Airbag Side Impact Rear Sensor - Left Door		—

Code	Name	Option	Location	Locator View	Connector End View
J800	Rear Side Door Door Wiring Harness - Right	—	In the right rear door, between breakout to M74RR Rear Side Door Window Regulator Motor - Right and breakout to B63RR Airbag Side Impact Rear Sensor - Right Door		—
J900	Endgate Wiring Harness	—	• (QK1) At the rear of the vehicle, within endgate, approximately 15 cm (5.85 in) from M14A Pickup Box Endgate Lock Actuator • (QK2) At the rear of the vehicle, within endgate, between breakout to A99L Pickup Box Endgate Latch - Left and breakout to A99R Pickup Box Endgate Latch - Right		—
J901	Endgate Wiring Harness	—	At the rear of the vehicle, within endgate, between breakout to A99L Pickup Box Endgate Latch - Left and breakout to A99R Pickup Box Endgate Latch - Right	—	—
J902	Endgate Wiring Harness	—	At the rear of the vehicle, within endgate, between breakout to A99L Pickup Box Endgate Latch - Left and breakout to A99R Pickup Box Endgate Latch - Right	—	—
J903	Endgate Wiring Harness	—	At the rear of the vehicle, within endgate, between breakout to A99L Pickup Box Endgate Latch - Left and breakout to A99R Pickup Box Endgate Latch - Right	—	—
J904	Rear Object Alarm Sensor Wiring Harness	—	At the rear of the vehicle, inside of rear fascia, in breakout to E7L Rear License Plate Lamp - Left		—
J905	Rear Object Alarm Sensor Wiring Harness	—	At the rear of the vehicle, inside of rear fascia, between breakout to E7R Rear License Plate Lamp - Right and breakout to E7L Rear License Plate Lamp - Left		—
J906	Rear Object Alarm Sensor Wiring Harness	—	At the rear of the vehicle, inside of rear fascia, between breakout to E7L Rear License Plate Lamp - Left and breakout to inline connector X950		—
J907	Rear Object Alarm Sensor Wiring Harness	—	At the rear of the vehicle, inside of rear fascia, between breakout to E7L Rear License Plate Lamp - Left and breakout to inline connector X951		—

Code	Name	Option	Location	Locator View	Connector End View
J908	Rear Object Alarm Sensor Wiring Harness	—	At the rear of the vehicle, inside of rear fascia, between breakout to E7L Rear License Plate Lamp - Left and breakout to inline connector X952		—
J909	Rear Object Alarm Sensor Wiring Harness	—	At the rear of the vehicle, inside of rear fascia, between breakout to E7L Rear License Plate Lamp - Left and breakout to inline connector X953		—
J910	Rear License Plate Lamp Wiring Harness Extension Harness - Left	DZW	At the rear of the vehicle, approximately 34 cm (13.26 in) from breakout towards E3LF Rear Fender Clarence Lamp - Left Front	—	—
J911	Rear License Plate Lamp Wiring Harness Extension Harness - Right	DZW	At the rear of the vehicle, approximately 8 cm (3.12 in) from breakout towards E3RF Rear Clearance Lamp - Fender Right Front	—	—
J912	Rear License Plate Lamp Wiring Harness Extension Harness - Left	DZW	At the rear of the vehicle, approximately 10 cm (3.9 in) from breakout towards E3LF Rear Fender Clarence Lamp - Left Front	—	—
J913	Rear License Plate Lamp Wiring Harness Extension Harness - Right	DZW	At the rear of the vehicle, approximately 30 cm (11.7 in) from breakout towards E3RF Rear Clearance Lamp - Fender Right Front	—	—
J914	Rear Lamp Wiring Harness	—	At the rear of the vehicle, in left rear tail lamp harness	—	—
J915	Rear Lamp Wiring Harness	—	At the rear of the vehicle, in right rear tail lamp harness	—	—

Description and Operation

Power Mode Description and Operation

Serial Data Power Mode Master

The K9 Body Control Module (BCM) is the Power Mode Master and the K56 Serial Data Gateway Module is the Back-Up Power Mode Master.

The Power Mode Master uses various vehicle status conditions and inputs to determine the desired vehicle power mode state. The Power Mode (Off, Accessory, Run, Propulsion, Start) is communicated to other modules via Serial Data and other electrical signals in order to provide the proper feature operation for the appropriate power mode.

If the Power Mode Master cannot control or determine the correct Power Mode, the Backup Power Mode Master will take over and become the vehicle Power Mode Master and place the vehicle into the proper Power Mode by communicating with other modules via Serial Data to provide the proper electrical signals to provide the proper feature operation for the appropriate power mode.

S38 On/Off Vehicle Switch

There are 5 power modes to convey driver intent:

- OFF – A low power mode that allows maximum stand time until next start
- ACCY – Allows use of certain features that require operator authorization (Power windows for example). Propulsion is specifically disallowed.
- RUN – All features enabled except propulsion (motive force)
- PROPULSION – All features enabled
- START - This will transition to PROPULSION, including turning off non-essential loads to provide additional power for starting.

Power Mode States

Customer Action	Expected Vehicle Power Mode	S38 Vehicle On/Off Switch BCM Scan Tool Parameter	S38 Vehicle On/Off Switch Voltages
Vehicle OFF, S38 On/Off Vehicle Switch not pressed, Transmitter in Range	Vehicle Off Mode	Inactive	1.4 – 3.0 V (Switch Pressed) 3.35 – 4.26 V (Switch Released) 4.5 — 5.0 V (Switch Disconnected)
Vehicle OFF, S38 On/Off Vehicle Switch not pressed, Transmitter out of Range/Away from vehicle	Vehicle Off Mode	Inactive	
Vehicle in any Power Mode EXCEPT OFF, then Press the S38 On/Off Vehicle Switch Foot On or Off the Brake Pedal, Transmitter in Vehicle	Vehicle Off Mode	Active (pushed) / Inactive (not pushed)	
Vehicle in Propulsion Mode, momentarily Press and Release the S38 On/Off Vehicle Switch Foot On or Off the Brake Pedal, Transmitter out of Range/Away from vehicle	Run Mode, With DIC Message No Remote Detected Press Brake to Restart	Active (pushed) Inactive (not pushed)	
Vehicle Off Power Mode, then Press the S38 On/Off Vehicle Switch for less than 5 s with foot Off the Brake Pedal; Transmitter in Vehicle	Vehicle Accessory Mode	Active (pushed) / Inactive (not pushed)	
Vehicle Off Power Mode, then S38 On/Off Vehicle Switch with foot On the Brake Pedal; Transmitter in Vehicle	Vehicle Start/Propulsion Mode (vehicle cranks then engine running (for Internal Combustion Engine) or Propulsion System Active for EV) power mode timeout is enabled	Active (pushed) / Inactive (not pushed)	
Vehicle Off Power Mode, then S38 On/Off Vehicle Switch with foot On the Brake Pedal for 5 to 10 s; Transmitter in Vehicle	Vehicle Start/Propulsion Mode (vehicle cranks then Propulsion Mode Active) power mode timeout will be disabled.	Active (pushed) / Inactive (not pushed)	
Vehicle OFF Power Mode, then Press and Hold the S38 On/Off Vehicle Switch for 5 s with foot Off the Brake Pedal; Transmitter in Vehicle	Vehicle Run Mode (Ignition ON without the Propulsion system Active)	Active (pushed) / Inactive (not pushed)	
Vehicle OFF Power Mode, then Press and Hold the S38 On/Off Vehicle Switch for 5 s with foot Off the Brake Pedal; Transmitter in Vehicle	Vehicle Start/Propulsion Mode (vehicle cranks then Propulsion Active) power mode timeout is disabled	Active (pushed) / Inactive (not pushed)	
Vehicle Propulsion Mode with vehicle speed detected above 4 km/h (2.5 MPH) press and hold S38 On/Off Vehicle Switch for 2 s or press and release it 2 times within 5 S.	Vehicle will transition from Propulsion Mode to Run Mode (Ignition On Propulsion system Inactive).	Active (pushed) / Inactive (not pushed)	
NOTE: If the transmitter is not moved for more than 1 hour it will become inactive.			

Service Mode

Service Mode is the Run Power Mode with power mode timeout disabled. This can only be done with the Service Tool.

Automatic Power Mode Timeouts

Note: If the Transmitter/Fob remains stationary and is not moved for one hour, it will go to sleep and may create a fob not in range condition.

This system is designed to prevent batteries from going dead in the event the ignition is left on while unattended, it is also designed to shut the vehicle off if left running unattended. After a Power Mode timeout, the Power Mode Master is responsible for shutting down the or transitioning the vehicle into the low parasitic sleep state “OFF” Power Mode. This Power Mode timeout strategy uses Vehicle Speed, Vehicle Power Mode, Parked Status and other Vehicle Conditions to make the timeout determination.

Accessory Power Mode
The Accessory Power Mode will timeout after approximately 5 minutes. The timer will Start once the system has determined it is in the Accessory Power Mode status. After the timer expires the Power Mode will change to the OFF Power Mode.

Run Power Mode
If the conditions listed below are met the Run Power Mode will timeout after approximately 40 minutes if the transmitter is in range, or 20 minutes if the transmitter is out of range. The timer will Start once the system has determined it is in the Run Power Mode status and all of the following conditions are met. After the timer expires the Power mode will change to OFF Power Mode.

If any of the following conditions are not met and/or if there is a change in the Brake Pedal or Clutch Pedal status, the Run Mode timeout timer will be disabled, and the timer will restart after all of the conditions are met again.

- Vehicle in Run Mode (Vehicle powered up S38 On/Off Vehicle Switch Green indicator on Propulsion Mode Inactive)
- Propulsion is Inactive
- Vehicle in Park.
- Vehicle Speed is 0 KM/MPH.
- Fast Idle is inactive (If Equipped).
- PTO Remote Start Status is inactive (If Equipped).
- Particulate Filter Cleaning Status is Inactive (if Equipped)
- S38 Vehicle On/Off switch is held for more than 5 to 10 seconds while starting the vehicle. The actual time may vary based on model and/or year.

Propulsion Power Mode
If the following conditions listed below are met the Propulsion Power Mode will timeout after approximately 30 minutes if the transmitter is in range, or 15 minutes if the transmitter is out of range. The timer will Start once the system has determined it is in the Propulsion Power Mode status and all of the following conditions are met. After the timer expires the Power mode will change to the OFF Power Mode.

The Propulsion Power Mode timeout can be disabled with the vehicle in Off Power Mode, apply and continue to hold the brake pedal, then press and hold the S38 Vehicle On/Off switch for 5 to 10 seconds (the actual time may vary based on model and/or year). A DIC message will be displayed when Power Mode timeout is disabled.

If any of the following conditions are not met and/or if there is a change in the Brake Pedal or Clutch Pedal status, the Propulsion Mode timeout timer will be disabled, and the timer will restart after all of the conditions are met again.

- Vehicle in Propulsion Mode (Propulsion Active).
- Vehicle in Park.
- Vehicle Speed is 0 KM/MPH.
- Fast Idle is Inactive (If Equipped).
- PTO Remote Start Status is inactive (If Equipped).
- Particulate Filter Cleaning Status is Inactive (if Equipped)
- S38 Vehicle On/Off switch iss held for more than 5 to 10 seconds while starting the vehicle. The actual time may vary based on model and/or year.

Relay Controlled Power Mode

The BCM uses discrete push button switch inputs, transmitter in range status, current power mode state, and brake pedal position state to distinguish the correct power mode (Off, Accessory Mode, Run Mode, Start/Propulsion Mode). The BCM, after determining the desired power mode, will activate the appropriate relays for that power mode.

The retained accessory power relay remains on for a timed period after the Ignition Mode is OFF. Refer to *Retained Accessory Power Description and Operation 8-911* for more information on the retained accessory power function.

Push Button Start

The ignition mode switch has 2 LEDs that indicate the vehicle power mode Amber for Accessory Mode and Green for Run or Start/Propulsion Modes. When the vehicle is in the OFF mode, both LED’s will be OFF. Momentarily pressing the S38 On/Off Vehicle Switch button once, brake pedal not applied, the vehicle will enter into the Accessory Mode and the Amber LED will illuminate. The Accessory Mode will timeout after approximately 5 min to help reduce battery drain. With the ignition OFF, brake pedal not pressed, then pressing and holding the S38 On/Off Vehicle Switch for 5 s will place the vehicle in Run Mode (Ignition ON without the Propulsion Mode Active). The vehicle will stay powered up for approximately 40 minutes if the transmitter is in range, or 20 minutes if the transmitter is out of range, and the Green LED will illuminate.

With the ignition OFF brake pedal pressed, then press and release the S38 On/Off Vehicle Switch, the vehicle will enter Start/Propulsion Mode and the Green LED will illuminate, the engine will crank and the engine will be running for Internal Combustion Engines (ICE), or Propulsion mode will go Active on Electric Vehicles (EV). The Propulsion Mode will timeout after approximately 30 minutes if the transmitter is in range, or 15 minutes if the transmitter is out of range. The timer will stop when the vehicle is shifted out of PARK or the brake pedal is pressed and released, the timer will reset after the vehicle is placed back in PARK with the Propulsion Mode Active.

Both LED's have the voltage supplied from the body control module (BCM). The ignition mode switch sends the ignition mode switch status to the passive entry passive start module (PEPS) and to the BCM. The PEPS module sends a redundant signal to the BCM with the ignition mode switch status.

Transport Mode

Transport Mode is designed to reduce the parasitic load of some modules during shipping and/or during vehicle storage. Some features may be disabled or have reduced functionality while Transport Mode is ON. Transport Mode is enabled and disabled by either of the following methods:

- With the Scan Tool Diagnostics > Body Control Module > Control Functions > Power Mode.
- Turning the hazard flashers ON, apply and hold the brake pedal, then press and hold the ignition mode switch for greater than 15 s. For vehicles equipped with a DIC a message Transport Mode On when it is enabled and Transport Mode Off when it is disabled will be displayed for a predetermined amount of time. For vehicles equipped without a DIC, the battery indicator light will constantly flash on the Instrument Cluster when Transport Mode is enabled.

Battery Saver Mode

There are 7 different Battery Saver Modes. Battery Saver Modes 1 to 3 occur in Accessory and Run Power Modes (vehicle on propulsion system Inactive) if the battery voltage drops below approximately 11.5 V. Battery Saver Modes 4 to 7 occur in the Off Power Mode only. Battery Saver Modes 4 to 7 may set DTC's.

- Battery Saver Mode 1: DIC message “Battery Low, Start Vehicle”, 4 chimes
- Battery Saver Mode 2: DIC message “Battery Low, Start Vehicle”, Load Shed Level 3 is activated
- Battery Saver Mode 3: DIC message “Battery Low, Start Vehicle”, Radio/Infotainment shut off, Load Shed Level 3 active
- Battery Saver Mode 4: Battery Saver Mode Ignition Off – Parasitic Current draw of 100 mA or greater
- Battery Saver Mode 5: Battery Saver Mode Ignition Off – Parasitic Current draw of 1 A or greater
- Battery Saver Mode 6: Battery Saver Mode Ignition Off – Battery Voltage less than 12.0 V
- Battery Saver Mode 7: Battery Saver Mode Ignition Off – Battery Voltage less than 11.6 V

Load Shedding

Prior to Load shedding Idle Boost will occur, the idle speeds will be increased by 25 to 300 RPM to help maintain a normal battery voltage. Idle Boost may be noticeable to the driver. If the battery voltage continues to drop below a normal state then load shedding will go active and it will start to reduce electric loads for components that will not impact the safe operation of vehicle. At load shed levels 2 and 3 a DIC message will be displayed “Reducing Features To Save Battery”. When load shedding is active the customer may begin to notice features starting to have reduced functions or may become inoperative. Examples of affected loads are radio, HVAC blower(s) front and rear (if equipped), heated/ventilated seats, heated mirrors, rear defogger and other devices with heavy electrical draws. Idle Boost and load shed levels can be observed with the scan tool.

Idle Boost 1
Idle is increased by 25-100 RPM and generally is not noticeable to most drivers.

Idle Boost 2
Idle is increased by 50–200 RPM and generally is not noticeable to most drivers.

Idle Boost 3
Idle is increased by 100–300 RPM and may be noticeable to most drivers.

Load Shed Level 1
Reduces load current by 25%.

Load Shed Level 2
Reduces load current by 50%.

Load Shed Level 3
Electric loads for components that will not impact the safe operation of vehicle will be turned Off.

BCM Awake/Sleep States

The BCM is able to control or perform all of the BCM functions in the awake state. The BCM enters the sleep state when active control or normal monitoring of system functions has stopped and a time limit has passed. The BCM must detect certain wake-up inputs before entering the awake state. The BCM monitors for these inputs during the sleep state.

The BCM will enter the awake state if any of the following wake-up inputs are detected:

- Activity on the serial data line
- Detection of a battery reconnect
- Any door open signal
- Headlamps ON
- Ignition ON
- Park lamps ON
- Keyless entry or remote start message

The BCM will enter a sleep state when all of the following conditions exist:

- Ignition OFF, transmitter is out of range
- No activity exists on the serial data line.
- No outputs are commanded.
- No delay timers are actively counting.
- No wake-up inputs are present.

If all these conditions are met, the BCM will enter a low power or sleep condition.

Retained Accessory Power Description and Operation

Retained Accessory Power

The Retained Accessory Power (RAP) & Interruptible RAP (IRAP) Circuits are controlled by the K9 Body Control Module (BCM). The BCM is the Power Mode Master, it utilizes various Vehicle inputs to determine the Vehicle Power Mode and sends this information via Serial Data and providing associated electrical signals to the entire vehicle for proper feature operation.

The BCM monitors the vehicles power modes, and door ajar/open switch status to determine whether the retained accessory power should be initiated and remain active or be terminated. The RAP output is optional based on the vehicles option contents. When utilized, the RAP Output control can be used to control a RAP Relay, it may provide direct power, or a serial data message to vehicle devices/modules from the BCM.

Retained Accessory Power Relay Coil Control Circuit (If Equipped)

The BCM keeps the device or relay (if equipped) energized during all power modes, except Off-Awake and Crank. The device(s) remain active for approximately 10 min after the Vehicle is placed into the OFF Power Mode, provided none of the doors are opened.

Retained accessory power will end when one of the following conditions are met:

- The BCM receives an input from any door ajar switch indicating the opening of the door after the OFF Power Mode is achieved.

Note: If the BCM receives a door open/ajar active signal when the vehicle is placed into the OFF Power Mode, the retained accessory power will not initiate.

- The BCM internal timer for the retained accessory power expires after approximately 10 min.

Systems powered by the retained accessory power control circuit during the retained accessory power mode are as follows:

Note: The vehicle may not be equipped with all components as listed below.

- 12 V Accessory Power Receptacle
- Cigarette Lighter Receptacle
- Window Switches
- Sunroof Control Module (If Equipped)
- Sunroof Switch (If Equipped)
- Mobile Device Wireless Charger Module
- Mobile Telephone Control Module (If Equipped)
- Traffic Data Receiver (If Equipped)
- Transmission Shift Lever Position Indicator (w/floor mounted console gear shift)

Serial Data Controlled Retained Accessory Power

Retained accessory power systems controlled by serial data are as follows:

Radio
Radio retained accessory power activation/termination is the same as relay operation with one exception; the only door that will turn the radio off during retained accessory power is the driver door open/ajar switch. The USB Ports will function the same as the radio.

Vehicle Communication Interface Module (VCIM) (Onstar®) (If Equipped)
VCIM RAP activation/termination is the same as radio operation with 1 exception; if there is an active call and the vehicle is placed in the OFF Power Mode, the VCIM will remain in RAP mode, and keep the radio in RAP mode until the call is terminated.

Interruptible Retained Accessory Power

The Power Mode Master (PMM) Controls components as needed If equipped with a RAP relay, the BCM controls the Retained Accessory Power with an exception, Interruptible Retained Accessory Power (IRAP) is deactivated during transmitter authentication. During Transmitter Authentication the PMM will deactivate components including IRAP to prevent Radio Frequency (RF) Interference (RFI) that may cause a “NO REMOTE DETECTED” message to be displayed on the drivers information center.

Note: If transmitter Authentication occurs while in Run or Propulsion Modes, it is normal to for IRAP to be interrupted momentarily (i.e. items connected to auxiliary power ports or chargers may momentarily go off then come back on).

If a remote transmitter was not been previously detected, Transmitter Authentication can occurs under any of the following conditions:

- The drivers side front door is opened.
- The drivers side rear door is opened.
- The S38 Vehicle On/Off Switch is pressed.

Special Purpose Vehicle Module Description and Operation

Special Purpose Vehicle Module

The K56U Special Purpose Vehicle Module is an interface module that allows the Upfitter to interface with GM vehicle’s secure CAN networks to request predefined actions and to indirectly monitor key vehicle data that is available on the vehicle network.

The module is available to be ordered by dealer or as an Accessory to be installed. If ordered by the dealer it will be installed and programmed by the assembly plant with the output controls disabled. If ordered as an Accessory it will need to be installed on the vehicle, programmed and configured.

Input Controls

The Input Controls are Defaulted on and a GM approved Upfitter Switch must be installed to operate the appropriate Output control that must be enabled by the Upfitter. The input circuits may set a DTC if a non approved switch is installed.

Switches
There are 5 predefined functions that may be requested by switching analog inputs to the required input voltage range.

Refer to *https://www.gmupfitter.com/* for details on all available options

Output Controls

The SPVM has ten outputs that can be configured with a user interface to allow outputs to be switched ON or OFF based on the data that is monitored and available from the GM vehicle network.

Input/Output Configuration

Inputs:

- Battery Power
- Ground
- High Speed CAN (hi/lo)
- 10 Analog Inputs (0.5A Maximum load)

Outputs:

- High Speed CAN (hi/lo)
- 10 Digital Outputs

Module Configuration

Refer to *https://www.gmupfitter.com/*

Section 9

Roof

Sunroof **9-2**
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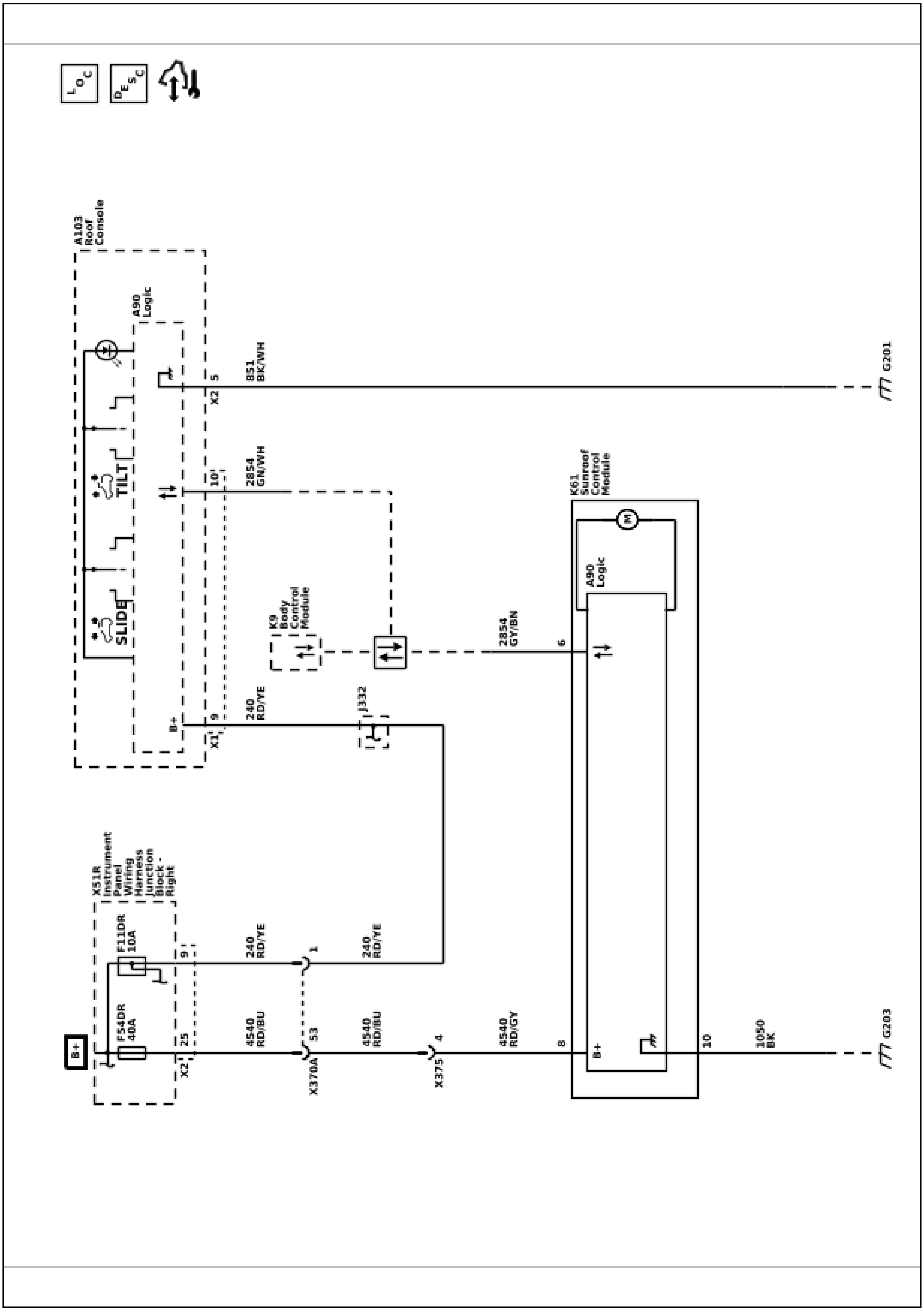
Description and Operation **9-4**
Sunroof Description and Operation 9-4

Roof

Sunroof

Schematic and Routing Diagrams

Sunroof Schematics (Sunroof (CF5))


6846411
LOC
DESC
A103
Roof
Console
A90
Logic
SLIDE
TILT
B+
X1
9
10
X2
5
851
BK/WH
G201
2854
GN/WH
K9
Body
Control
Module
2854
GY/BN
6
240
RD/YE
J332
K61
Sunroof
Control
Module
M
A90
Logic
X51R
Instrument
Panel
Wiring
Harness
Junction
Block -
Right
F11DR
10A
F54DR
40A
B+
9
25
X2
240
RD/YE
1
240
RD/YE
4540
RD/BU
53
X370A
4540
RD/BU
4
X375
4540
RD/GY
8
B+
10
1050
BK
G203

Description and Operation

Sunroof Description and Operation

Note: Not all sunroof systems use an electrically controlled sunshade.

To view the locations of the sunroof system components, refer to *Master Electrical Component List 8-855*

The sunroof system consists of a glass panel, sunshade, sunroof motor/module, sunshade motor/module or manual sunshade, sunroof slide and/or tilt switches, sunshade switch, and the body control module (BCM). The electrical portion of the system controls the movement of the sunroof and sunshade (if equipped). The BCM communicates with the sunroof and sunshade motor/module to enable or disable sunroof and sunshade operation. The sunroof and sunshade motors/modules provide system status and diagnostic information to the BCM for diagnostic reporting and operational purposes. The sunroof and sunshade are each controlled by the integrated motor/controller containing the necessary electronics, motor, hall effect position sensors, as well as the interface to the driver control switches. Each motor/controller is capable of controlling motion based on control switch activation and commands from the BCM. The sunroof and sunshade operation is interdependent on some vehicles, in which case they are controlled by the BCM. If the system is overloaded, the power supply is temporarily cut off.

Sunroof and Sunshade Control Switches

The sunroof slide, tilt, and sunshade slide open/close operations are controlled by switches. Some switches may support express open/close operation. Not all vehicles are equipped with all three switches and the behavior of the sunroof for each switch press is vehicle dependent. Some vehicles may have a tilt switch while others may have a vent feature linked to the slide switch. Not all vehicles are equipped with an electrically controlled sunshade, thus lacking the sunshade switch.

System Protection

Normal operation of the sunroof system may be altered when system protection is engaged.

Obstacle or Blockage Detection

Obstacle detection is active when moving in the closing direction and while the sunroof or sunshade opening is approximately 4–200 mm (0.16–7.87 in). When an obstacle is detected in this range, the motion in the closing direction will stop and the sunroof/sunshade will reverse direction for a short distance. The reversal will complete regardless of operating mode. If the travel is outside the range defined above, the sunroof/sunshade motor will continue closing until it detects a motor stall condition or the system is at one of the defined stops.

Motor Stall

If the sunroof or sunshade is moving in the open or close direction and stops moving for 350 ms while a command is active, and no obstacle has been detected, the motor will be turned off to prevent overheating.

Sunroof System Thermal Protection

The sunroof/sunshade controllers have a thermal protection algorithm to protect the sunroof/sunshade controls and motors from damage due to overheating conditions resulting from immoderate switch actuations. The thermal protection algorithm will cause any new sunroof/sunshade open commands to be ignored until the motors cool. A defined number of close requests are allowed during an over temperature condition. If the thermal protection is triggered during an obstacle detection event, the sunroof/sunshade reversal will finish first.

Sunroof and Sunshade Coordination

For vehicles with an electrically controlled sunshade, the BCM will command the sunshade to open to predefined positions based on the requested sunroof position. This interaction may also prohibit the sunshade from closing past these points depending on the sunroof position. Faults on the sunroof or sunshade motor/module circuits will disable the system.

Opening

If the sunroof is opened anywhere between the fully closed and vent position, the BCM will command the sunshade to a minimum open position provided that the sunshade is not opened adequately at the time of the sunroof command. If the sunroof receives an open or express open command beyond vent position, the BCM will command the sunshade to open approximately halfway if the sunshade is not opened adequately. This position corresponds to a point behind the leading edge of a fully opened sunroof glass.

Closing

The sunshade can only be closed completely with the sunshade switch if the sunroof is completely closed. If the sunroof is opened past the vent position, the sunshade will not be allowed to close past the halfway point.

Service Tool Commanded Open

When a service tool commands the sunshade to open, it results in the sunshade moving to the half way position or to the fully open position depending on the calibration. If the half way point is calibrated on, this position is as far as the sunshade can be opened with the service tool. To go beyond this point a switch activation must be used.

Rear Sunshade Operation

If equipped, the rear window sunshade is controlled by a switch with open, close, express open, and express close functionality.

Section 10

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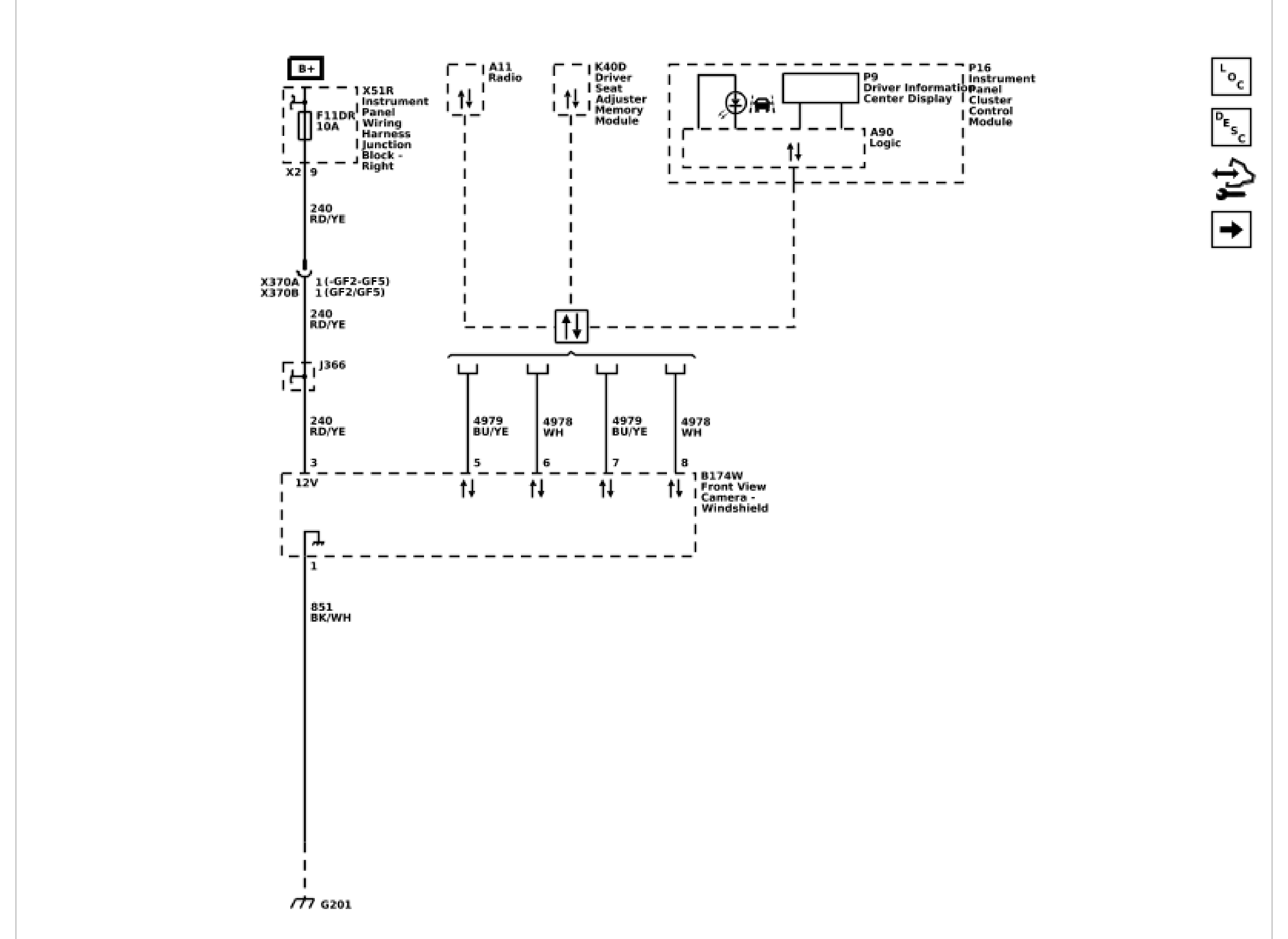
Safety and Security

Driver Assistance Systems

Schematic and Routing Diagrams

Driver Assistance Systems Schematics (Lane Keep Assist and Forward Collision Alert - Module Power, Ground, and Serial Data (UEU))


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F11DR 10A
X2 9
240 RD/YE
X370A 1 (-GF2-GF5)
X370B 1 (GF2/GF5)
240 RD/YE
J366
240 RD/YE
3
12V
A11 Radio
K40D Driver Seat Adjuster Memory Module
P9 Driver Information Center Display
P16 Instrument Panel Cluster Control Module
A90 Logic
4979 BU/YE
4978 WH
4979 BU/YE
4978 WH
5
6
7
8
B174W Front View Camera - Windshield
1
851 BK/WH
G201
LOC
DESC

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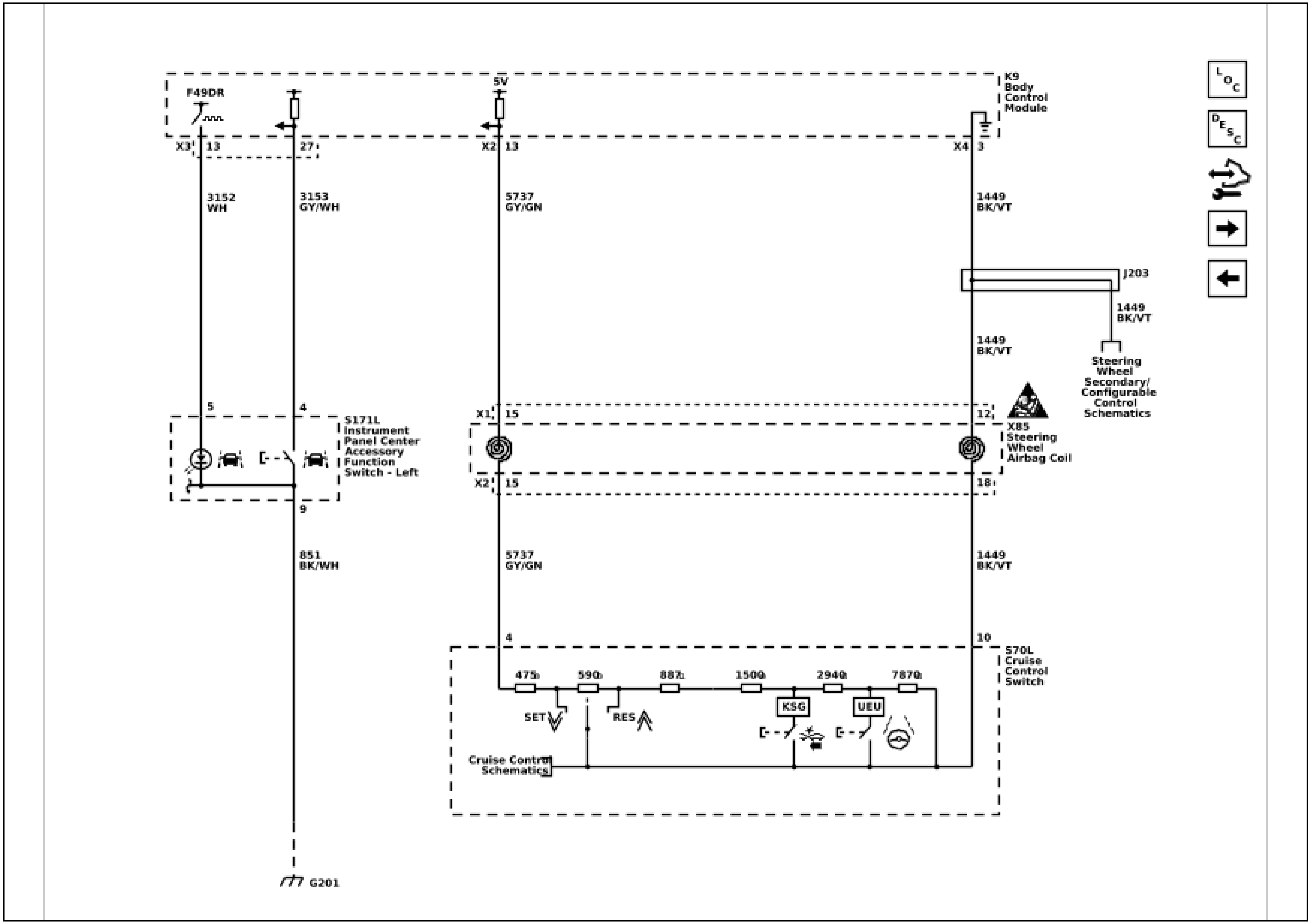
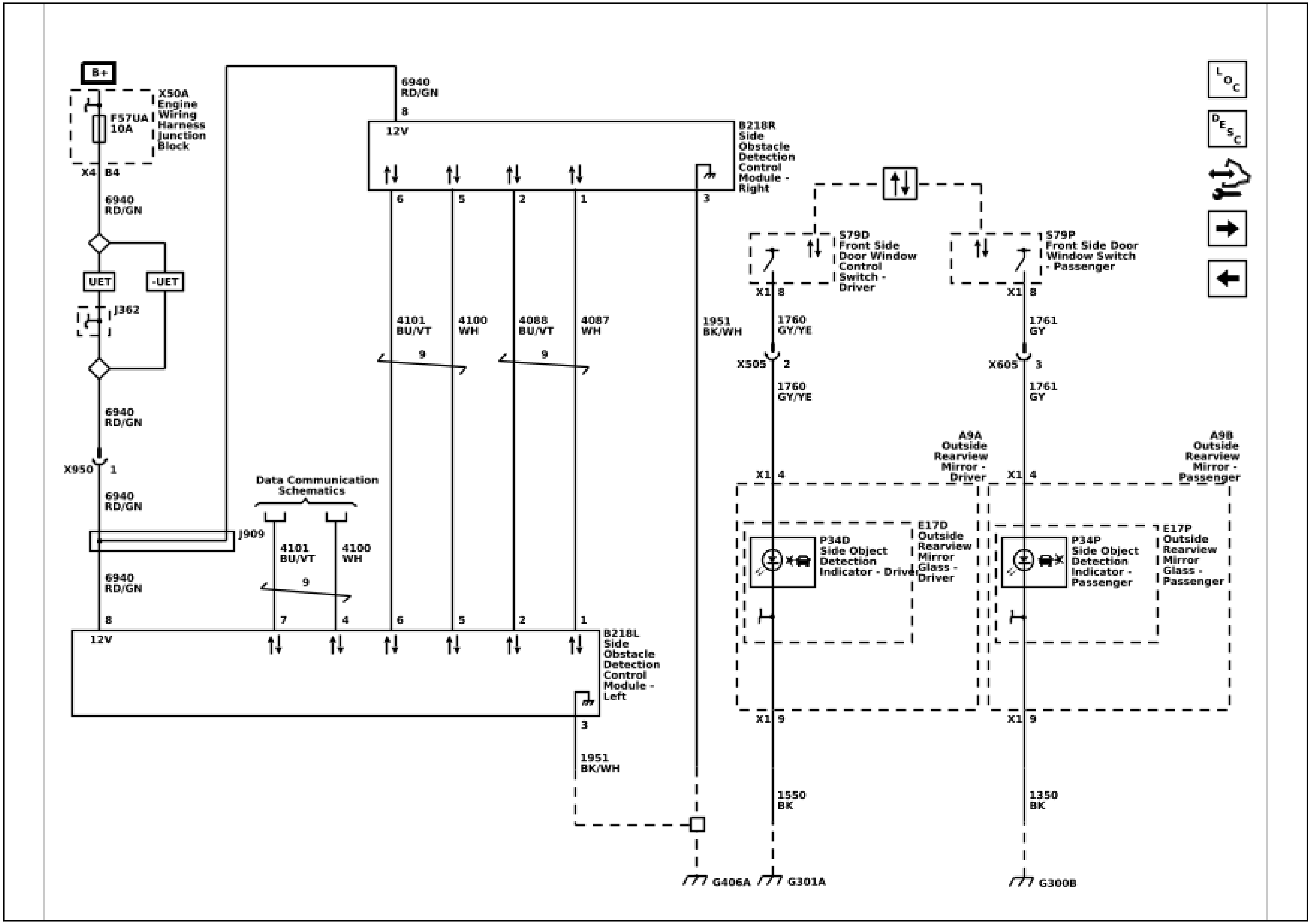
Driver Assistance Systems Schematics (Lane Keep Assist and Forward Collision Alert - Controls (UEU))


K9
Body
Control
Module
F49DR
5V
X3 13
27
X2 13
X4 3
3152
WH
3153
GY/WH
5737
GY/GN
1449
BK/VT
J203
1449
BK/VT
Steering
Wheel
Secondary/
Configurable
Control
Schematics
1449
BK/VT
5
4
S171L
Instrument
Panel Center
Accessory
Function
Switch - Left
9
851
BK/WH
G201
X1 15
12
X85
Steering
Wheel
Airbag Coil
X2 15
18
5737
GY/GN
1449
BK/VT
4
10
S70L
Cruise
Control
Switch
475Ω
590Ω
887Ω
1500Ω
2940Ω
7870Ω
SET
RES
KSG
UEU
Cruise Control
Schematics

6846413

Driver Assistance Systems Schematics (Side Object Detection (UKC / UKV))


B+
X50A Engine Wiring Harness Junction Block
F57UA 10A
X4 B4
6940 RD/GN
UET
-UET
J362
X950 1
J909
8
12V
B218R Side Obstacle Detection Control Module - Right
6 5 2 1 3
4101 BU/VT
4100 WH
4088 BU/VT
4087 WH
9
1951 BK/WH
Data Communication Schematics
7 4
B218L Side Obstacle Detection Control Module - Left
S79D Front Side Door Window Control Switch - Driver
S79P Front Side Door Window Switch - Passenger
X1 8
1760 GY/YE
X505 2
1761 GY
X605 3
A9A Outside Rearview Mirror - Driver
A9B Outside Rearview Mirror - Passenger
X1 4
P34D Side Object Detection Indicator - Driver
E17D Outside Rearview Mirror Glass - Driver
P34P Side Object Detection Indicator - Passenger
E17P Outside Rearview Mirror Glass - Passenger
X1 9
1550 BK
1350 BK
G406A
G301A
G300B
L O C
D E S C

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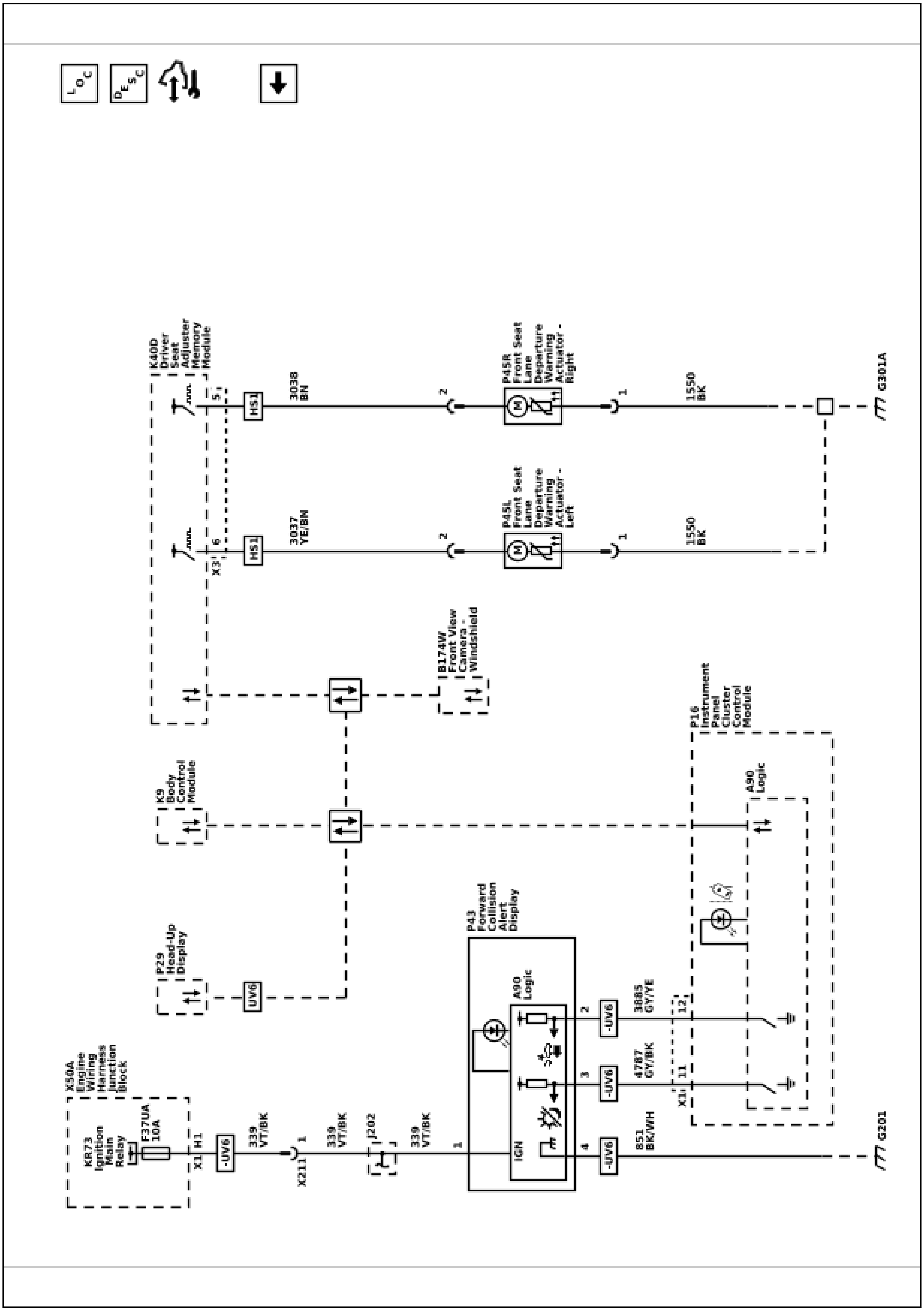
Driver Assistance Systems Schematics (Collision Alert Indicators)


6846415
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F37UA 10A
X1 H1
-UV6
339 VT/BK
X211 1
J202
339 VT/BK
339 VT/BK
1
IGN
P43 Forward Collision Alert Display
A90 Logic
2
3
4
-UV6
-UV6
-UV6
3885 GY/YE
4787 GY/BK
851 BK/WH
X1 11 12
G201
P29 Head-Up Display
UV6
K9 Body Control Module
P16 Instrument Panel Cluster Control Module
A90 Logic
B174W Front View Camera - Windshield
K40D Driver Seat Adjuster Memory Module
X3 6
5
HS1
HS1
3037 YE/BN
3038 BN
2
2
P45L Front Seat Lane Departure Warning Actuator - Left
P45R Front Seat Lane Departure Warning Actuator - Right
1
1
1550 BK
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Description and Operation

Adaptive Cruise Control Description and Operation

The adaptive cruise control system is an enhanced cruise control system with the ability to detect the presence of a vehicle in the path and react by automatically adjusting the vehicle speed to maintain a set following distance. Adaptive cruise control retains the existing cruise control feature that controls the vehicle speed to the driver selected speed, but also allows a driver to set and maintain a following distance to the preceding nearest vehicle in the path ahead. The B174W Frontview Camera – Windshield calculates a follow speed to ensure an acceptable distance is maintained to the preceding vehicle in front, should one be present. The adaptive cruise control system automatically adjusts the speed when the vehicle comes up behind a slower travelling vehicle. The system applies limited automatic braking and throttle control without driver input when necessary to maintain the set following distance. The preceding vehicle's speed and acceleration along with the adaptive cruise control vehicle’s speed and acceleration and the distance between the two vehicles are factors used by the B174W Frontview Camera – Windshield to determine the follow speed limit. The vehicle speeds up to the original driver selected set speed when the pathway becomes clear without driver input.

The adaptive cruise control system has the ability to bring the vehicle to a complete stop if a preceding vehicle also stops. This ability is limited by the maximum deceleration of the preceding vehicle. If the preceding vehicle stops too quickly, driver intervention is required, as the deceleration required will exceed the capability of the adaptive cruise control system. If the deceleration rate of the preceding vehicle is within the capability of the adaptive cruise control system, the vehicle will come to a complete stop. When the preceding vehicle has resumed, the driver will be prompted to continue adaptive cruise control operation. When the driver resumes adaptive cruise control operation, the vehicle will accelerate and continue typical adaptive cruise control operation.

Adaptive Cruise Control Components

The adaptive cruise control functionality depends on various switches and control modules on the vehicle to function. Each component performs a function that is critical to the proper operation of the adaptive cruise control system. Adaptive cruise control will not operate if any single component has a fault. Communication between modules is via serial data. The following is a functional description of the B174W Frontview Camera – Windshield and the other associated components:

- Frontview Camera – Windshield
- K9 Body Control Module
- K20 Engine Control Module
- K17 Electronic Brake Control Module (if equipped)
- K160 Brake System Control Module (if equipped)
- P16 Instrument Cluster
- Cruise Control Switch
- Adaptive Cruise Control Gap Switch

B174W Frontview Camera – Windshield
The B174W Frontview Camera – Windshield analyzes data from various modules, sensors, and switches to provide enhanced safety features. In addition to enhanced safety features, the B174W Frontview Camera – Windshield provides the adaptive cruise control system functionality. The B174W Frontview Camera – Windshield utilizes it’s own camera and internal logic to identify and classify objects in the road environment. The system scans the road environment to detect targets within its specified field of view. The B174W Frontview Camera – Windshield then sends throttle and/or brake commands to the K20 Engine Control Module and K17 Electronic Brake Control Module or K160 Brake System Control Module via serial data in order to control the vehicle acceleration/ deceleration based on the data from the modules. The K20 Engine Control Module and K17 Electronic Brake Control Module or K160 Brake System Control Module provide throttle control and automatic braking needed for proper speed and braking adjustment. The following is a list of the B174W Frontview Camera – Windshield pertaining to the adaptive cruise control functionality:

- Processes the road environment to get data concerning any vehicle ahead of the adaptive cruise control vehicle. Detection, parameter estimation, tracking, object classification and diagnostics are the primary functions. When an object is detected, the B174W Frontview Camera – Windshield calculates the object range, range rate, acceleration and azimuth angle parameters.
- Performs adaptive cruise control distance control or speed control processing automatically. The adaptive cruise control operates in two possible states – cruise or follow. The normal operating state is cruise, whereby the vehicle speed is controlled to match the driver selected set speed. When a preceding vehicle is identified, the adaptive cruise control system will automatically transition into the follow speed state to provide proper lane spacing behind the target vehicle in front. The preceding vehicle's speed and acceleration, with the adaptive cruise control vehicle speed, acceleration and distance between the two vehicles will be used to determine the adaptive cruise control follow speed limit. The adaptive

cruise control follow speed limit will ensure that an acceptable distance is maintained to the preceding vehicle.

- Determines the follow speed limit for throttle control by the K20 Engine Control Module and arbitrates the brake and throttle control between the K17 Electronic Brake Control Module or K160 Brake System Control Module and the K20 Engine Control Module.
- Requests brake light activation during automatic braking.
- Provides operational feedback to the vehicle driver. The B174W Frontview Camera – Windshield sends signals for telltales and messages to be displayed on the P16 Instrument Cluster or driver information center.

K9 Body Control Module

The following are the adaptive cruise control System functions provided by the K9 Body Control Module:

- Monitors all cruise control switches and the adaptive cruise control gap switch. The K9 Body Control Module relays the switch status to the B174W Frontview Camera – Windshield via serial data.
- Illuminates the brake light based on a serial data message from the B174W Frontview Camera – Windshield during automatic braking.
- Measures the brake pedal position and sends brake pedal travel status via serial data circuit to the K20 Engine Control Module. The K20 Engine Control Module disengages the adaptive cruise control system when the driver presses the brake pedal.

K20 Engine Control Module

The following are the adaptive cruise control system functions performed by the K20 Engine Control Module:

- Provides the electronic throttle control to the adaptive cruise control System. The K20 Engine Control Module is also responsible for determining when a driver is overriding the adaptive cruise control throttle position by pressing the accelerator pedal.
- Processes the cruise control switch requests received via serial data circuit from the K9 Body Control Module. Engaging and disengaging the adaptive cruise control system are functions performed by the K20 Engine Control Module.
- Determines the driver selected vehicle speed. Unless the adaptive cruise control module requests a lower vehicle speed, the K20 Engine Control Module will control the vehicle speed to the driver selected set speed.
- Allows automatic braking without disengaging the adaptive cruise control.

K17 Electronic Brake Control Module (if equipped)

The following are the adaptive cruise control System functions performed by the K17 Electronic Brake Control Module:

- Provides automatic braking for the adaptive cruise control system. The B174W Frontview Camera – Windshield will request vehicle deceleration via serial data circuit.
- Releases vehicle automatic braking when there is a throttle override by the driver pressing the accelerator.
- Predicts brake temperatures. Excessive automatic braking may cause, the brake system may overheat. When the brakes are overheated, the K17 Electronic Brake Control Module requests the adaptive cruise control system to be temporarily disabled until the brakes cool to a normal operating temperature.

K160 Brake System Control Module (if equipped)

The following are the adaptive cruise control system functions performed by the K160 Brake System Control Module:

- Provides automatic braking for the adaptive cruise control system. The B174W Frontview Camera – Windshield will request vehicle deceleration via serial data circuit.
- Releases vehicle automatic braking when there is a throttle override by the driver pressing the accelerator.
- Predicts brake temperatures. Excessive automatic braking may cause, the brake system may overheat. When the brakes are overheated, the K160 Brake System Control Module requests the adaptive cruise control system to be temporarily disabled until the brakes cool to a normal operating temperature.

P16 Instrument Cluster

The driver information center is a part of the P16 Instrument Cluster and displays the adaptive cruise control system warning messages. The B174W Frontview Camera – Windshield requests messages to be displayed on the driver information center by sending a serial data request. When the message is acknowledged by the driver and the cause of the message resolved, the driver information center turns the message off. The adaptive cruise control system will not operate if the driver information center has a fault.

Cruise Control Switch

The cruise control switch function is a common feature that is shared between the adaptive cruise control system and the regular cruise control system. The adaptive cruise control system will not operate if any cruise control switch fault exists. The cruise control switch is made up of the following cruise control function switches:

- On/Off switch
- Set/decrease switch
- Resume/increase switch

The cruise control function switches are arranged in a resistor ladder design whereby each switch function is has a different resistance value. The K9 Body Control Module provides a constant voltage reference to the cruise control switches and monitors switch feedback from a specific signal circuit. When a button is pressed, the voltage monitored on the signal circuit changes based on the number of resistors in the resistor ladder. The K9 Body Control Module recognizes this voltage as a specific cruise control switch function. The associated cruise control function detected by the K9 Body Control Module is then sent to the K20 Engine Control Module as a serial data circuit message. On receiving the message, the K20 Engine Control Module provides the cruise control function requested by the K9 Body Control Module. The K20 Engine Control Module is responsible for recognizing and responding to cruise control switch requests sent by the K9 Body Control Module. The cruise control function switches are used by the K20 Engine Control Module to communicate to the B174W Frontview Camera – Windshield the driver selected vehicle speed. The driver selected vehicle speed is communicated through serial data circuit to the B174W Frontview Camera – Windshield and the K9 Body Control Module. The adaptive cruise control system engages and adjusts vehicle speeds based on the activation of the following cruise control function switches:

Adaptive Cruise Control Gap Switch

The gap switch allows the driver to determine how closely the adaptive cruise control vehicle follows a target vehicle while adaptive cruise control is engaged. When the adaptive cruise control vehicle speed is being limited due to a slower travelling vehicle, the adaptive cruise control vehicle speed is automatically controlled to the follow distance. The gap switch has three following distance selections that range from near to far. The distance maintained for a selected gap will vary based on vehicle speed: The faster the vehicle speed, the greater the gap. The gap setting can only be adjusted when the adaptive cruise control system is engaged.

The gap switch is a momentary switch located as part of the cruise control switch assembly. The gap switch is located in a resistor ladder. The K9 Body Control Module provides a constant voltage reference to the gap switch and monitors switch feedback from a specific signal circuit. When the gap switch button is pressed, the voltage monitored on the signal circuit changes based on the number of resistors in the resistor ladder. The K9 Body Control Module recognizes this voltage as the gap switch function. The gap switch is detected by the K9 Body Control Module and then sent to the K20 Engine Control Module and B174W Frontview Camera – Windshield as a serial data message. After receiving the message, the K20 Engine Control Module and B174W Frontview Camera – Windshield will adjust the following distance based on the driver selected setting.

The initial push of the gap switch recalls the current setting and activates the display. Subsequent pushes of the gap switch will change the gap setting.

Adaptive Cruise Control Operation

Adaptive cruise control uses the B174W Frontview Camera – Windshield, which looks directly ahead to monitor vehicles that a driver is following. Adaptive cruise control helps drivers follow a vehicle ahead at the following gap they select — Far, Medium or Near — while they steer. This reduces the driver's need to frequently brake and accelerate.

If the system does not detect a vehicle ahead, adaptive cruise control will resort to traditional cruise control operation. When the system detects a vehicle ahead in the driving lane, the vehicle ahead icon will appear in green on the P16 Instrument Cluster. When the vehicle detected ahead is within the selected following gap setting, adaptive cruise control can automatically slow the vehicle down and adjust vehicle speed to follow the vehicle ahead at the selected following gap. Like regular cruise control, adaptive cruise control uses ON/OFF, CANCEL, SET and RESUME buttons on the steering wheel.

Getting started:

- To turn adaptive cruise control on, the driver should press the cruise control ON/OFF button.
- When the system is turned on, the driver information center in the P16 Instrument Cluster will show a white adaptive cruise control icon.
- To choose a cruise speed, the driver should press the SET button while driving at the desired speed. The white adaptive cruise control icon will change to green, indicating that adaptive cruise control is engaged
- The adaptive cruise control gap switch on the steering wheel lets drivers select a Far, Medium or Near following gap between their vehicle and the vehicle ahead. Both adaptive cruise control and forward collision alert are set at the same setting.

Setting the gap:

- When drivers initially press the gap switch, the currently selected gap setting displays briefly on the P16 Instrument Cluster.
- Each press of the switch cycles through the gap settings: Far, Medium or Near
- Since each gap setting corresponds to a following time (Far, Medium or Near), the following distance will vary based on the vehicle speed. As the vehicle speeds up, the following gap will increase to accommodate the greater distance it would take the vehicle to slow down or come to a stop.
- The gap setting will be maintained until the driver changes it.
- Drivers should consider traffic and weather conditions when using adaptive cruise control. Safety or driver assistance features are no substitute for the driver's responsibility to operate the vehicle in a safe manner. The driver should remain attentive to traffic, surroundings and road conditions at all times. Visibility, weather and road conditions may affect feature performance. Read the vehicle's Owner's Manual for more important feature limitations and information.

Adaptive cruise control can follow a vehicle ahead to a stop. When the vehicle ahead starts moving again, the driver should check that it is safe to proceed, then continue to automatically follow the vehicle ahead by pressing the accelerator or resume button. If the driver doesn't respond soon after the stop, the vehicle ahead icon will flash. In addition, an audible notification will sound, or if equipped, the safety alert seat will pulse to remind the driver to check traffic ahead before proceeding.

If the adaptive cruise control is controlling speed and detects that the vehicle is approaching a vehicle ahead too quickly and adaptive cruise control cannot apply sufficient braking, such as when vehicles ahead suddenly slow or stop, drivers will receive a forward collision alert to warn them to quickly take action. This alert includes a red flashing visual alert, an audible notification, or, if equipped, the safety alert seat will pulse.

If the driver uses the accelerator pedal while adaptive cruise control is active, a driver information center warning message will indicate that automatic braking will not occur. In some vehicles, instead of the message, the green adaptive cruise control icon will change to blue.

Switching between cruise control modes (if available):

- The driver should press and hold the cruise control CANCEL button.
- The driver will see either the adaptive cruise control icon or the regular cruise control icon on the driver information center. This icon indicates which cruise control mode has been selected.
- Drivers should check which cruise control icon is displayed before setting their cruise control speed.

The driver can end adaptive cruise control by doing any of the following:

- Stepping lightly on the brake pedal
- Pressing the cruise control CANCEL button
- Pressing the cruise control ON/OFF button

Set At Standstill

On properly equipped 2024+ model year vehicles, you can also set an Adaptive Cruise Control speed while your vehicle is stopped. You can only do this when the system is on, the brake pedal is applied and your vehicle is in a Forward gear

If equipped with the Set at Standstill feature, when the vehicle is stopped in traffic, press the Set button while your foot is on the brake to engage Adaptive Cruise Control. You can then manipulate the set speed, with a foot still on the brake, by touching the Resume/+ or Set/- button repeatedly until the system shows the desired speed. You can then lift your foot off the brake, and the vehicle will hold its position

Once traffic moves, push the Resume button or tap the accelerator pedal, and your vehicle will automatically accelerate to the set speed or following gap time if a vehicle is detected ahead.

Adaptive Cruise Control Operational Checks

Safety Considerations

- The system can only apply limited braking. The driver's complete attention is always required while driving
- The system may not react to parked, stopped or slow-moving vehicles; the driver should always be ready to take action and apply the brakes
- Driver should not use adaptive cruise control on winding or hilly roads, on freeway exit or entrance ramps or when trailering. In these driving conditions, the system may not detect the vehicle ahead
- The system cannot detect traffic lights or traffic signs, so the driver needs to safely brake accordingly whenever approaching an intersection with a traffic light or stop sign
- If no vehicle ahead is detected, adaptive cruise control will work like regular cruise control
- When using adaptive cruise control, the driver should keep in mind that the system is designed to

follow detected vehicles ahead at a longer distance when traveling at higher speeds than at lower speeds

- To avoid using adaptive cruise control by accident, advise customers to keep the cruise control button off when they don't need it. They should press the ON/OFF button and verify that the adaptive cruise control icon is not lit

Adaptive cruise control may have difficulty detecting the following objects:

- Vehicles in front of the driver's vehicle that have a rear aspect that is low, small or irregular
- A truck or trailer that has no cargo in the cargo bed
- Vehicles with cargo extending from the back end
- Non-standard shaped vehicles, such as vehicle transport, vehicles with a sidecar or horse carriages
- Vehicles that are low to the road surface
- Objects that are close to the front of the driver's vehicle

Weather conditions can affect adaptive cruise control:

- If the vehicle's interior temperature is extremely high, the P16 Instrument Cluster may indicate that adaptive cruise control is temporarily unavailable. This can be caused by extreme hot weather conditions with direct sunlight on the front camera. Adaptive cruise control will return to normal operation once the cabin temperature is cooler
- Conditions that are associated with low visibility, such as fog, rain, snow or road spray, may limit the performance of adaptive cruise control. Water droplets from rain or snow that remain on the windshield may also limit adaptive cruise control's ability to detect objects

The B174W Frontview Camera – Windshield can be hampered by poor lighting conditions, including when:

- Multiple changes in brightness, such as shadows along the roadway, entering and exiting tunnels, or bridges and overpasses
- Low sun angles may cause the camera to not detect objects, or make it more difficult to detect oobjects in the same lane
- Lighting is poor in the evening or early morning
- The vehicle is in a tunnel without the headlamps on, or in a tunnel when there is a vehicle ahead that does not have its taillamps on
- The vehicle is subjected to strong light from the oncoming opposing lane traffic, such as high-beam headlamps from oncoming traffic

Forward Collision Alert Description and Operation

Forward Collision Alert (UEU)

The forward collision alert system is a convenience feature of the B174W Frontview Camera – Windshield that can warn drivers of a possible front-end collision situation with a vehicle they are following. The B174W Frontview Camera – Windshield is located behind the windshield, looking out at the road ahead and detecting vehicles directly ahead. When a vehicle is detected ahead, a green icon is displayed. This indicator will turn amber if the driver is following too closely. If the system detects that the driver is seconds away from a possible front-end collision, it sends an alert. The P43 Collision Alert Indicators, which includes a series of red collision alert LEDs, will flash. An audible alert sound will simultaneously sound. If the vehicle is equipped with safety alert seat (HS1), both sides of the seat will pulse. The forward collision alert system can be set to "far," "medium," or "near" timing using the forward collision alert switch and can be turned off using this control or through the vehicle personalization.

Forward collision alert does not provide a warning to help avoid a crash unless it detects a vehicle. Forward collision alert may not detect a vehicle ahead if the B174W Frontview Camera – Windshield is blocked by dirt, snow, or ice, or if the windshield is damaged. It may also not detect a vehicle on winding or hilly roads, or in conditions that can limit visibility such as fog, rain, or snow, or if the headlamps or windshield are not cleaned or in proper condition. Keep the windshield, headlamps, and B174W Frontview Camera – Windshield area clean and in good repair.

Forward collision alert may provide unnecessary alerts for turning vehicles, vehicles in other lanes, objects that are not vehicles, or shadows. These alerts are normal operation and the vehicle does not need service.

Forward Automatic Braking (UHY)

Forward automatic braking detects vehicles ahead in your path that are traveling in the same direction and may help reduce crash severity or avoid the crash altogether by applying the brakes automatically or enhancing the driver's braking in some emergency front-end collision situations . It can provide braking assist, such as brake system pre-fill, or automatically brake the vehicle if an imminent collision is determined. This can help avoid or lessen the severity of crashes when driving in a forward gear. Depending on the situation, the vehicle may automatically brake moderately or hard. Forward automatic braking can only occur if a vehicle is detected. When a vehicle is detected ahead, a green icon is displayed. The forward automatic braking system works when driving in a forward gear between 8 km/h (5 mph) and 80 km/h (50 mph). It can detect vehicles up to approximately 60 m (197 ft) away.

If the system detects that the driver is seconds away from a possible front-end collision with the vehicle it is following, it will first send an alert. If the driver doesn't respond quickly or the situation happens suddenly, forward automatic braking enhances the driver's braking or automatically applies the brakes. Drivers can override automatic braking at any time by pressing the accelerator or by braking. If the system slows a vehicle to a complete stop, the electronic parking brake will apply. The electronic parking brake can be release in typical fashion by pressing the electronic parking brake switch.

Through vehicle personalization, the forward automatic braking can be set to the ALERT setting or turned completely off. This setting disables most automatic braking functions. The driver information center will display FORWARD COLLISION SYSTEM REDUCED or AUTOMATIC COLLISION PREP REDUCED. This is normal operation when the forward automatic braking or forward collision alert system is set to OFF or ALERT. This message is not present when the forward automatic braking or forward collision alert system are set to ALERT and BRAKE.

Forward Collision Alert/ Forward Automatic Braking Components

- B174W Frontview Camera – Windshield
- P16 Instrument Cluster
- P43 Collision Alert Indicators (except UV6)
- P29 Head-Up Display (UV6)
- Forward Collision Alert Switch
- Infotainment System
- Safety Alert Seat (HS1)

B174W Frontview Camera – Windshield

The B174W Frontview Camera – Windshield detects vehicles in front of the vehicle. The B174W Frontview Camera – Windshield communicates with the P16 Instrument Cluster via serial data to illuminate the appropriate amber or green vehicle ahead indicator or P43 Collision Alert Indicators. The B174W Frontview Camera – Windshield also communicates via serial data with the infotainment system to request audible alerts.

P16 Instrument Cluster

The P16 Instrument Cluster communicates via serial data with the B174W Frontview Camera – Windshield and will illuminate the amber or green vehicle ahead indicator as requested by the B174W Frontview Camera – Windshield. The P16 Instrument Cluster also controls the P43 Collision Alert Indicators.

P43 Collision Alert Indicators (except UV6)

The P43 Collision Alert Indicators are a series of red LEDs that will flash when approaching another vehicle too rapidly. The P43 Collision Alert Indicators are located in the upper instrument panel area and reflect off the windshield when illuminated.

The P43 Collision Alert Indicators receive power and ground and are discretely controlled by the P16 Instrument Cluster through a pair of low control circuits. When requested by the B174W Frontview Camera – Windshield, the P16 Instrument Cluster will pulse the low control circuits, flashing the LEDs as a visual alert that another vehicle is being approached too rapidly.

P29 Head-Up Display (UV6)

The P16 Instrument Cluster controls the P29 Head-Up Display via serial data. The P16 Instrument Cluster will command the P29 Head-Up Display to flash the collision alert indicator as a visual alert when approaching another vehicle too rapidly as requested by the B174W Frontview Camera – Windshield.

Forward Collision Alert Switch

The forward collision alert switch provides an input to the B174W Frontview Camera – Windshield to select the alert timing sensitivity when approaching another vehicle too rapidly. The forward collision alert switch is part of the S70L Steering Wheel Controls Switch – Left and provides inputs to the K9 Body Control Module, which then communicates with the B174W Frontview Camera – Windshield via serial data.

The K9 Body Control Module applies voltage and monitors a low signal voltage from the normally open switch. When the switch is pressed, the signal circuit is pulled low through a specific series of resistors, indicating that the system has been requested to change the alert timing sensitivity. The first button press will show the current alert timing setting on the driver information center. With every subsequent button press, the alert timing sensitivity is changed.

Infotainment System

The infotainment system controls the audible alerts for the forward collision alert system. If the vehicle is approaching another vehicle too rapidly, the B174W Frontview Camera – Windshield will command the infotainment system issue an audible alert to the driver.

Safety Alert Seat (HS1)

The K40 Seat Memory Control Module controls the haptic alert provided by the seats. If the vehicle is approaching another vehicle too quickly, the B174W Frontview Camera – Windshield will command the K40 Seat Memory Control Module to pulse both sides of the seat.

Forward Collision Alert and Forward Automatic Braking Operational Checks

If the forward collision alert system is off, inoperative, or not functioning, check the following:

- Verify there are no active driver information center messages and that no DTCs are set.
- Verify that the system is enabled through vehicle personalization. Vehicle personalization allows the system to be set to “Off,” “Beeps,” ”Alert,” “Safety Alert Seat,” or “Alert & Brake”.
- Attempt to replicate the customer concern. While driving, if the vehicle-ahead telltale display illuminates green when following a vehicle above 8 km/h (5 mph) , forward collision alert is operating properly.

If the driver is receiving false forward collision alerts, check the following:

- Verify the B174W Frontview Camera – Windshield is not blocked by dirt, snow, or ice, and the windshield is not damaged.
- The system may be identifying vehicles farther ahead than the customer is expecting. Forward collision alert detects vehicles within a distance of approximately 60 m (197 ft) and operates at speeds above 8 km/h (5 mph).
- Forward collision alert may provide unnecessary alerts to turning vehicles, vehicles in other lanes, objects that are not vehicles, or shadows. These alerts are normal operation and the vehicle does not need service.

If forward collision alert beeps, but the seat does not vibrate, check the following:

- Verify the vehicle is equipped with safety alert seat (RPO HS1).
- Verify there are no active driver information center messages and that no DTCs are set.
- Verify that the system is enabled through vehicle personalization: It may be set to “Beeps” or “Alert Only” instead of “Safety Alert Seat” or “Alert & Brake”.

If FORWARD COLLISION SYSTEM REDUCED or AUTOMATIC COLLISION PRE REDUCED is displayed on the driver information center, check the following:

- Verify that the system is enabled through vehicle personalization: It may be set to “Alert Only” instead of ”Off” or Alert & Brake”.

If SERVICE FRONT CAMERA is displayed on the driver information center, check the following:

- Verify there are no active driver information center messages and that no DTCs are set.
- If the message is only displayed upon startup, check the following:
    - Verify the B174W Frontview Camera – Windshield is not blocked by dirt, snow, or ice, and the windshield is not damaged.
    - Verify the vehicle is not parked closed to a wall or the B174W Frontview Camera – Windshield is not in an over-temperature condition, such as sitting for long periods in high ambient temperatures and direct sun.
- If the message is displayed beyond startup, check the following:
    - Verify there are no active driver information center messages and that no DTCs are set.

If FRONT CAMERA IS BLOCKED is displayed on the driver information center, check the following:

- Check for any other driver information center service messages.
- Verify the B174W Frontview Camera – Windshield is not blocked by dirt, snow, or ice, and the windshield is not damaged.

If SERVICE DRIVER ASSIST is displayed on the driver information center, check the following:

- Check for any other driver information center service messages.
- Verify there are no active driver information center messages and that no DTCs are set.

Lane Departure Warning Description and Operation

The lane departure warning system is a convenience feature that utilizes the B174W Frontview Camera – Windshield to determine if the vehicle has unintentionally crossed a lane marking and issue a warning. The B174W Frontview Camera – Windshield is located behind the windshield, looking out at the road ahead and detecting any lane markings. When the vehicle unintentionally leaves a detected lane, visual and audible alerts are given to the driver. The visual alert cannot be changed, but the driver can select audible alerts in the vehicle personalization menus. Refer to the vehicle owner’s manual for vehicle personalization options.

The lane departure warning system utilizes the following components:

Lane Departure Warning Components

- B174W Frontview Camera – Windshield
- P16 Instrument Cluster
- Lane Departure Warning Switch
- Infotainment system

- Safety Alert Seat (HS1)

B174W Frontview Camera – Windshield

The B174W Frontview Camera – Windshield detects visual queues such as lane markings. When it is determined that the vehicle has unintentionally moved outside of the lane, visual and audible or haptic (if equipped) warning is given to the driver. The B174W Frontview Camera – Windshield receives an input from the lane departure warning switch and controls the lane departure warning switch indicator output. The B174W Frontview Camera – Windshield also communicates via serial data with the P16 Instrument Cluster and infotainment system to request visual and audible alerts.

P16 Instrument Cluster

The P16 Instrument Cluster contains green and amber lane departure warning indicators. These indicators inform the driver of the current status of the lane departure warning system and are controlled via serial data by the B174W Frontview Camera – Windshield. When the vehicle speed is above 56 km/h (35 MPH) and the system has detected the required lane markings and is ready to assist, the green indicator will be illuminated. If the vehicle has unintentionally left the lane, the amber indicator will flash.

Lane Departure Warning Switch

The lane departure warning switch provides an input to the B174W Frontview Camera – Windshield to turn the lane departure warning system on and off. The B174W Frontview Camera – Windshield applies voltage and monitors the lane departure warning switch signal circuit. The lane departure warning switch is a normally open switch. With the switch open, voltage seen at the B174W Frontview Camera – Windshield is high. When the lane departure warning switch is pressed, the switch is closed and the signal circuit is pulled to ground. With the switch closed, voltage seen at the B174W Frontview Camera – Windshield is low. The B174W Frontview Camera – Windshield will respond to this by activating or deactivating the lane departure warning system.

The lane departure warning switch also utilizes the lane departure warning indicator, which is part of the lane departure warning switch and is controlled by the B174W Frontview Camera – Windshield to indicate the operational status of the lane departure warning system. When the lane departure warning is enabled, the B174W Frontview Camera – Windshield will illuminate the indicator on the switch. The indicator receives voltage through a high control circuit from the K9 Body Control Module and is controlled through a low control circuit by the B174W Frontview Camera – Windshield.

Infotainment System

The infotainment system controls the audible alert for the lane departure warning. If the vehicle has unintentionally left the lane, the B174W Frontview Camera – Windshield will request via serial data an audible alert to the driver through the infotainment system

Safety Alert Seat (HS1)

The K40 Seat Memory Control Module controls the haptic alert provided by the seats. If the vehicle is approaching a lane marking, the B174W Frontview Camera – Windshield will command the K40 Seat Memory Control Module to pulse the appropriate P45 Seat Haptic Movement Motor that corresponds with the side of the vehicle approaching the lane marking..

Lane Departure Warning Operation

System Operational Modes

- Off State: The system has been turned off by the driver using the lane departure warning switch. The lane departure warning indicator located on the lane departure warning switch will not be illuminated.
- Not Ready To Assist: The system is enabled and the lane departure warning indicator located on the lane departure warning switch is illuminated, but the system is not ready to assist because one of the following conditions is true:
    - Vehicle speed is less than 56 km/h (35 MPH). The system is designed to function at speeds greater than 56 km/h (35 MPH).
    - The system cannot detect lane markings. This may be because there are no lane markings or the lane markings cannot be determined due to snow, rain, or other driving conditions.
    - The windshield area in front of the camera or the camera lens is blocked by fog, dirt, damage to the windshield, or other elements that may prevent the camera from detecting lane markings.
- Ready To Assist: The system is enabled and ready to warn of the unintentional lane crossing. The system is ready to assist when the green lane departure warning indicator is illuminated on the P16 Instrument Cluster.

Lane Crossing Alerts

- A lane crossing alert consists of the following:
    - The amber lane departure warning indicator located on P16 Instrument Cluster will flash.
    - Three chimes are activated through the infotainment system
- When any of the following conditions occurs, the system will not give alerts:

  - The appropriate turn signal is activated. An activated turn signal is interpreted as an intentional lane crossing.
  - The operator makes an intentional steering maneuver.
  - The operator makes an intentional accelerating maneuver.
  - The operator makes an intentional braking maneuver.

Lane Departure Warning Operational Checks

If lane departure warning is not functioning, check the following:

- Verify the vehicle is equipped with lane departure warning (RPO UFL).
- Check for a SERVICE FRONT CAMERA or SERVICE DRIVER ASSIST message on the driver information center.
  - If either message is present, an issues exists with the B174W Frontview Camera – Windshield that is affecting all camera functions, not just lane departure warning. Verify no DTCs are set and refer to the appropriate diagnostic procedure.
- Verify the lane departure warning indicator turns on and off when pressing the lane departure warning switch.
  - If the indicator does not turn on and off, verify no DTCs are set and refer to the appropriate diagnostic procedure.
- Operate the vehicle above 56 km/h (35 MPH) with good lane markings and no inclement weather (snow, rain, or low sun) and verify the green lane departure warning indicator is illuminated on the P16 Instrument Cluster.
  - Verify there are no active driver information center messages and that no DTCs are set.

Lane Keep Assist Description and Operation

The lane keep assist system is a convenience feature that utilizes the B174W Front View Camera - Windshield maintains the vehicle location between identified lane markings. The B174W Front View Camera - Windshield is located behind the windshield, looking out at the road ahead and detecting any lane markings. If the vehicle begins to approach an identified lane marking, automatic correction will be applied by the electric power steering to move the vehicle back toward the center the lane. An integrated function of lane keep assist is lane departure warning. When the vehicle unintentionally leaves a detected lane, visual and audible or haptic (if equipped) alerts are given to the driver. The visual alert cannot be changed, but the driver can select between audible or haptic alerts in the vehicle personalization menus.

Lane Keep Assist System Components

The lane keep assist system is made up of the following components:

- B174W Front View Camera - Windshield
- Driver Information Display
- Multi-axis acceleration sensor (part of the K36 Restraints Control Module)
- Steering wheel angle sensor (part of the K43 Power Steering Control Module)
- K43 Power Steering Control Module
- Lane keep assist switch
- Infotainment system
- Safety alert seat (with HS1)

B174W Front View Camera - Windshield

The B174W Front View Camera - Windshield detects visual queues such as lane markings. When it is determined that the vehicle is approach an identified lane marking, automatic correction will be applied by the electric power steering to move the vehicle back toward the center the lane. Using the multi-axis acceleration sensor and steering wheel angle sensor, the B174W Front View Camera - Windshield determines the vehicles path and compares this to it’s own intended path based on lane markings. The B174W Front View Camera - Windshield will then request the K43 Power Steering Control Module to perform the appropriate steering correction. The B174W Front View Camera - Windshield receives an input via serial data from the lane keep assist switch and controls the lane keep assist switch indicator output.

Driver Information Display

Based on vehicle configuration, the P53 Driver Information Display, P16 Instrument Panel Cluster Control Module, or A105 Instrument Panel Multifunction Human-Machine Interface Control Module contains green and amber lane keep assist indicators. These indicate to the driver the current status of the lane keep assist system and are controlled via serial data by the B174W Front View Camera - Windshield. When the vehicle speed is above the minimum required speed (refer to owner manual) and the system has detected the required lane markings and is ready to assist, the green indicator will be illuminated on the driver information display. If the vehicle has unintentionally left the lane, the amber indicator will flash.

Multi-axis Acceleration Sensor

The steering intervention is based on the forward looking sensor outputs, such as lateral offset of the vehicle, relative yaw angle and time to line crossing. Over that, other vehicle dynamics signals are needed, e.g. velocity, steering angle, yaw rate for the purpose of a driver suppression. The multi-axis acceleration sensor measures vehicle dynamics signals such as velocity and yaw rate for the purpose of determining the vehicles path. The multi-axis acceleration sensor is an integrated part of the K36 Restraints Control Module.

Steering Wheel Angle Sensor
The steering intervention is based on the forward looking sensor outputs, such as lateral offset of the vehicle, relative yaw angle and time to line crossing. Over that, other vehicle dynamics signals are needed, e.g. velocity, steering angle, yaw rate for the purpose of a driver suppression. The steering wheel angle sensor measures vehicle dynamics signals such as steering angle for the purpose of determining the vehicles path. The steering wheel angle sensor is an integrated part of the steering gear and K43 Power Steering Control Module.

K43 Power Steering Control Module
The K43 Power Steering Control Module uses a torque sensor to detect driver inputs and relays that information to the B174W Front View Camera - Windshield. The electric power steering is used to maintain lane centering.

Lane Keep Assist Switch
The lane keep assist switch provides an input to the B174W Front View Camera - Windshield via serial data to turn the lane keep assist system on and off. The B174W Front View Camera - Windshield provides a signal voltage to the normally open momentary switch. When the switch is pressed, the signal circuit is pulled to ground, indicating to the B174W Front View Camera - Windshield that the system has been requested to turn ON or OFF. The lane keep assist switch also contains the lane keep assist switch indicator, which is controlled by the B174W Front View Camera - Windshield to indicate the ON and OFF status of the lane keep assist system. When the system has been enabled by the lane keep assist switch, the B174W Front View Camera - Windshield applies ground to the switch indicator via serial data and illuminates the LED. The location of the lane keep assist switch can vary with different vehicles. For the exact location please refer to the vehicle owner’s manual.

Infotainment system
The radio controls the audible alert for the lane keep assist. If the vehicle has unintentionally left the lane, the radio will command three beeps as an audible alert to the driver.

Safety Alert Seat (with HS1)
The K9 Body Control Module (without A45) or K40D Driver Seat Adjuster Memory Module (with A45) controls the haptic alert provided by the seats. If the vehicle has unintentionally left the lane and the K43 Power Steering Control Module determines the corrective action requires an above threshold amount of effort, three pulses to the left or right side of the seat will be commanded, depending on the lane departure direction.

Lane Keep Assist Operation

Lane keep assist with lane departure warning provides gentle steering wheel input and alerts to help prevent drivers from unintentionally drifting out of their intended lane.

There is two stages of warning/intervention for the driver: The first stage is the steering push back, if the lane keep assist system detects that the vehicle will cross the lane marking despite it is intervening, a second stage warning shall be issued. The second stage warning is a chime or a haptic alert through the safety alert seat (if equipped). If a haptic seat vibration is used as stage 2 warning, the vibration will occur on the side of the seat, where the lane departure occurred.

System operation can be described by the following modes:

- Off State: The system has been turned off by the driver using the lane keep assist switch. The lane keep assist indicator will not be illuminated.
- Not Ready To Assist: The system is enabled and the lane keep assist indicator is illuminated, but not ready to assist when any of the following conditions is true:
  - Vehicle speed is less than required for lane keep assist operation. Refer to Owner’s Manual for operational speed.
  - The system cannot detect lane markings. This may be because there are no lane markings, as on a country road or that the lane markings cannot be determined due to snow, rain, or other driving conditions.
  - The windshield area in front of the camera or the camera lens is blocked by fog, dirt, damage to the windshield or other elements that may prevent the camera from detecting lane markings.
- Ready To Assist: The system is enabled and ready to warn of the unintentional lane crossing. The system is ready to assist when the green lane keep assist indicator is illuminated on the driver information display.

Lane Crossing Alerts
- When one of the following conditions are met, the system will not give alerts:
  - The correct turn signal is activated. An activated turn signal is interpreted as an intentional lane crossing.
  - The operator makes an intentional steering maneuver.

  - The operator makes an intentional accelerating maneuver.
  - The operator makes an intentional braking maneuver.
- Lane crossing alert consists of the following:
  - The amber lane keep assist indicator will flash.
  - “push-back” steering torque input (or nudge) from electric power steering to help prevent a lane departure
  - Three chimes are activated through the radio or three pulses to the left or right side of the active safety seat (if equipped).

Hands On Lane Centering Assist (if equipped)

Hands on Lane Centering Assist operates similar to Lane Keep Assist but provides continuous lateral assistance to help keep the vehicle in the center of the lane while Adaptive Cruise Control is engaged. Hands on Lane Centering Assist utilized the steering wheel touch sensors and driver monitoring camera to ensure the driver actively has their hands on the steering wheel and has eyes on the road.

Hands on Lane Centering Assist must be enabled in infotainment vehicle settings, Adaptive Cruise Control engaged, and road lanes visible by the Front view Camera-Windshield: in order for the Hands on Lane Centering Assist to operate.

System states:

- Standby: (white Hands-On steering wheel icon with white lane keep assist lines) feature not engaged due to possible environmental or driver reasons.
- Active: (green Hands-On steering wheel icon with green lane keep assist lines) feature is active and controlling
- Lane Departure Warning: (amber Hands-On steering wheel icon with flashing amber lane keep assist lines) activated when the vehicle moves outside of a predefined threshold of the lane. The system detects that the vehicle is drifting toward or beyond the lane markings.
- Environmental degrades : (amber Hands-On steering wheel icon with white lane keep assist lines) operation degrades are currently alerting for environmental reasons such as lane line confidence low, exceeds road curvature limit, etc.
- Driver Override: (white Hands-On steering wheel icon with white lane keep assist lines) driver has taken control from Hands On Lane Centering Assist.

If the system senses the driver is not meeting necessary requirements (hands on wheel, eyes on road) driver warnings will escalate and can deactivate Hands On Lane Centering Assist. If this occurs three times, the Hands On Lane Centering Assist will be unavailable for the remainder of the Ignition/Vehicle On cycle.

Safety Alert Seat Description and Operation

The safety alert seat uses pulsing driver seat vibrations to intuitively communicate the direction of a possible crash threat. Two P45 Seat Haptic Movement Motors are utilized to create the vibration and are located on the left and right sides of the seat cushion. Utilizing two motors allows the vibration to be localized to the left or right side of the seat, depending on the side of the vehicle generating the alert, or to vibrate both simultaneously.

Note: The following systems may not be available on all vehicles.

The following systems utilize the safety alert seat:

- Lane Departure Warning and Lane Keep Assist – Utilizes left or right-side pulses to alert drivers if they unintentionally drift out of their lane
- Rear Cross Traffic Alert – Utilizes left or right-side pulses to the direction of an approaching vehicle
- Forward Collision Alert – Simultaneously pulses on both sides to warn drivers of a possible collision with the vehicle that they’re following
- Front Pedestrian Braking – Simultaneously pulses on both sides to warn drivers of a possible collision with a pedestrian
- Front Parking Assist, Rear Parking Assist, and Backing Warning (part of the Rear Automatic Braking system) – Simultaneously pulses on both sides to warn drivers of a possible low-speed collision

Safety Alert Seat Components

The active safety seat utilizes the following components:

- K40 Seat Memory Control Module
- P45LR Seat Haptic Movement Motor — Driver Left Rear
- P45RR Seat Haptic Movement Motor — Driver Right Rear

K40 Seat Memory Control Module

The K40 Seat Memory Control Module receives serial data messages from other modules and provides voltage to control the P45 Seat Haptic Movement Motors. The K40 Seat Memory Control Module will pulse the left, right, or both P45 Seat Haptic Movement Motors with the number of pulses requested over serial data. The K40 Seat Memory Control Module monitors the control circuits for open, short to ground, and short to voltage conditions and will set DTCs if a circuit fault is detected.

P45 Seat Haptic Movement Motor
The P45 Seat Haptic Movement Motor is DC motor located in the driver’s seat bottom cushion. Two P45 Seat Haptic Movement Motors are used in the seat bottom cushion, positioned on the left and right side. An offset weight is attached to the motor. When activated, the spinning offset weight creates a vibration felt by the driver through the seat cushion.

Each P45 Seat Haptic Movement Motor receives a constant chassis ground. The motor is controlled by the K40 Seat Memory Control Module by providing voltage through a dedicated control circuit. When an alert is required, the K40 Seat Memory Control Module will apply voltage, activating the P45 Seat Haptic Movement Motor

Side Blind Zone Alert Description and Operation

The side blind zone alert system detects and reports “objects of interest" on either side of the vehicle, within a specified “blind spot” zone. The system is designed to alert the driver, with a visual display placed on the side view mirror, to the presence of objects of interest that may not be visible in the inside rearview mirror and outside rear view mirrors. Although this system is intended to help drivers avoid lane change collisions, it does not replace driver vision and therefore should be considered a lane change aid. Even with the side blind zone alert system, the driver must check carefully for objects outside of the reporting zone (e.g., a fast approaching vehicle) before changing lanes. In the event that the system senses a malfunction through its diagnostic routines, the system will be disabled and the driver will be visually notified.

When the system detects a vehicle in the side blind zone while driving forward, an amber warning symbol will light up in the appropriate outside mirror. This indicates that it may be unsafe to change lanes. If the driver then activates the turn signal, the amber warning symbol starts flashing as an extra warning not to change lanes.

Side blind zone alert is active when the vehicle is out of park, or the parking brake is off on manual transmission vehicles and at speeds up to approximately 140 km/h (87 MPH). If a vehicle is detected in the blind zone, the warning symbols will turn illuminate on the appropriate side. When the vehicle is started, both outside mirror displays will briefly come on to indicate that the system is operating. The warning symbols will vary brightness based on the ambient light conditions.

The side blind zone alert system is made up of the following components:

- B218L Side Object Sensor Module – Left
- B218R Side Object Sensor Module – Right
- A9A Outside Rearview Mirror – Driver
- A9B Outside Rearview Mirror – Passenger
- Safety Alert Seat (HS1)

B218 Side Object Sensor Module
The B218L Side Object Sensor Module – Left and B218R Side Object Sensor Module – Right are located on each side of the vehicle behind the rear fascia and are not directly visible from outside the vehicle. The B218 Side Object Sensor Modules use radar to determine the presence of objects nearby. When an object is detected in the side blind zone, the appropriate B218 Side Object Sensor Module supplies voltage to illuminate the visual indicator on the A9 Outside Rearview Mirror. Each B218 Side Object Sensor Module is supplied B+ and ground. Both B218 Side Object Sensor Modules communicates with the vehicle via serial data.

A9 Outside Rearview Mirror
The A9A Outside Rearview Mirror – Driver and A9B Outside Rearview Mirror – Passenger each contain an icon that is backlit with high intensity, amber-colored LED’s located on the mirror surface. The display brightness adapts to day/night conditions. The side blind zone alert indicator icon in the appropriate A9 Outside Rearview Mirror is illuminated if the specific B218 Side Object Sensor Module detects a vehicle in the side blind zone to inform the driver that there is a vehicle driving in the blind spot zone.

Safety Alert Seat (HS1)
The K40 Seat Memory Control Module controls the P45 Seat Haptic Movement Motors. The P45 Seat Haptic Movement Motors provide haptic alert to the driver. If an object is detected, the K40 Seat Memory Control Module will command pulses to the P45LR Seat Haptic Movement Motor – Driver Left Rear or P45RR Seat Haptic Movement Motor – Driver Right Rear, depending on the location of the object, as an alert to the driver.

Side Blind Zone Alert Operation

When the vehicle is started, both A9 Outside Rearview Mirror indicators will briefly come on to indicate that the system is operating. The system is designed to detect objects of interest as small as a 125cc motorcycle with rider. The detection zone starts at the outside rearview mirror and extends out to 3.5 m (11 ft) at the back corner of the vehicle and 3 m (10 ft) behind the vehicle at a height of 0.5 m (1.5 ft) and 2.0 m (6 ft) above the ground. The system may illuminate an indicator due to guardrails, signs, trees, shrubs, and other non-moving objects. This is normal system operation; the vehicle does not need service.

When the system detects a vehicle in the side blind zone or lane change alert area while driving forward, independent if passing a vehicle or being passed, an amber warning symbol will light up in the appropriate A9 Outside Rearview Mirror. This indicates that it may be unsafe to change lanes. If the driver then activates the turn signal, the amber warning symbol starts flashing as an extra warning not to change lanes.

Foul weather may affect the operation of the side blind zone and lane change alert systems. Occasional missed alerts can occur under normal circumstances and will increase in wet conditions. The number of missed alerts will increase with increased rainfall or road spray. Heavy rainfall, as well as mud, dirt, snow, ice, or slush build-up on the rear fascia, can completely disable the system.

If the vehicle is towing a trailer or has an object such as a bicycle rack attached to the rear of the vehicle, the side blind zone and lane change alert systems may not function properly and the indicators may illuminate intermittently or remain illuminated all the time.

Lane Change Alert Operation

An integrated function of the side blind zone alert system is lane change alert. Lane change alert supplements the side blind zone alert system by detecting approaching vehicles on either side of the vehicle that may not yet be in the side blind zone alert area. The detection zone for lane change alert starts at the outside rearview mirror and extends out to 3.5 m (11 ft) at the back corner of the vehicle and 70 m (230 ft) behind the vehicle at a height between 0.5 m (1.5 ft) and 2.0 m (6 ft) above the ground.

Rear Cross Traffic Alert Operation

Rear cross traffic alert displays a red warning triangle with a left or right pointing arrow on the infotainment display to warn of traffic coming from the left or right. This system detects objects coming from up to 20 m (65 ft) from the left or right side of the vehicle. When an object is detected, either three beeps sound from the left or right or three safety alert seat pulses occur on the left or right side, depending on the direction of the detected vehicle.

Driver Information Center Messages

SIDE BLIND ZONE ALERT OFF

This message indicates that the system has been disabled through the driver information center. Refer to the vehicle owner’s manual for instructions on how to set personalization options on the driver information center.

SERVICE SIDE DETECTION SYSTEM

This message indicates that the system requires service. When the message is displayed, the indicators will remain illuminated at all times, notifying the driver that the side blind zone system should not be relied upon when changing lanes. Since the sensors are also used for rear cross traffic alert, this feature will also be inoperative.

SIDE DETECTION SYSTEM TEMPORARILY UNAVAILABLE

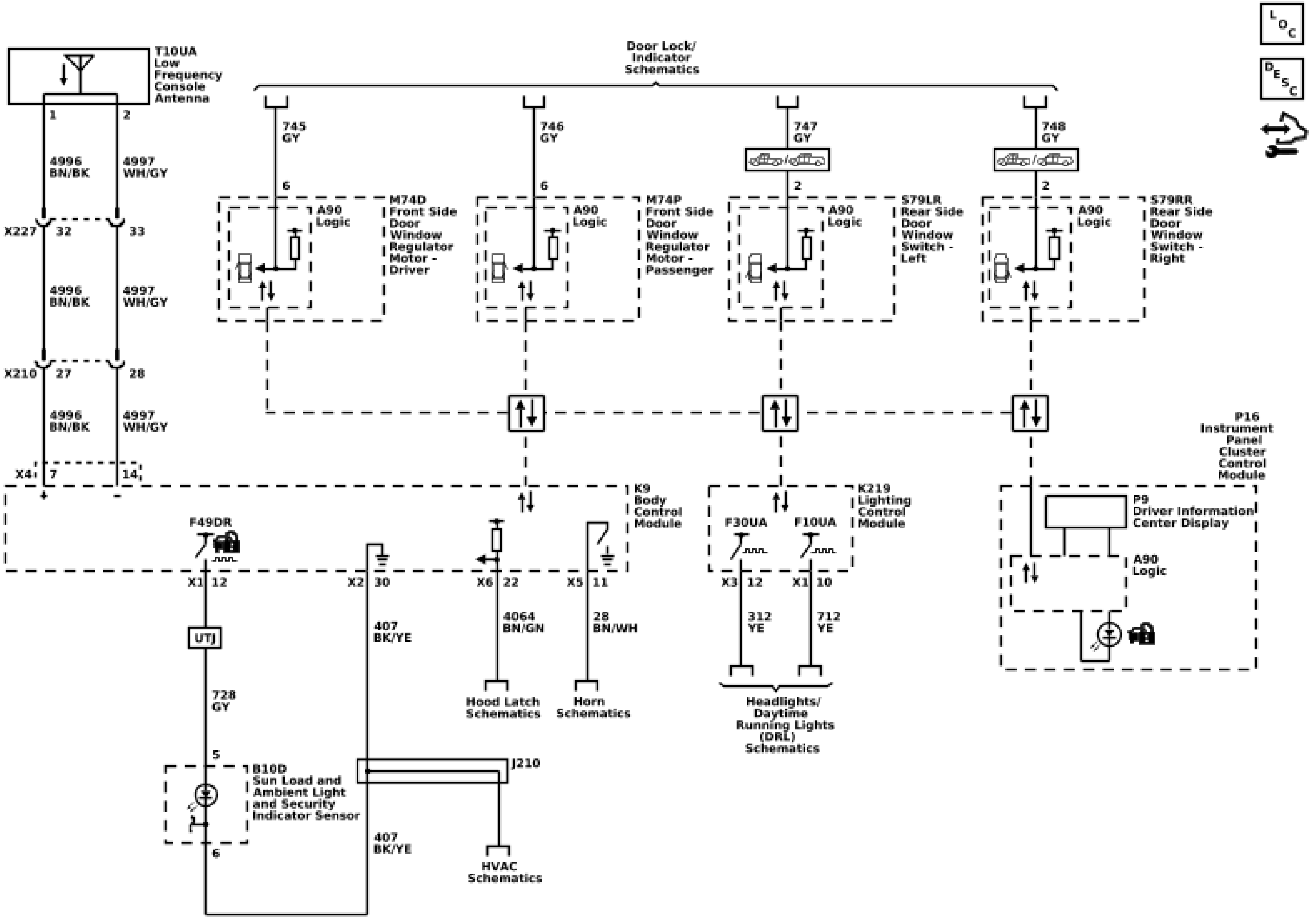
This message indicates that the system has been temporarily disabled because the sensor is blocked or can otherwise not accurately detect vehicles or objects. Examples are snow, ice, or slush build-up or mud or dirt packed into the sensor area. A “Side Detection System Temporarily Unavailable” message will be displayed on the driver information center. The side blind zone system transitions back to the normal operating state when the blockage is removed. Bumper stickers, fascia damage, labels, and heavy rain may also cause this condition. The blockage determination is performed with the vehicle in a drive gear. After the blockage is removed, it may take 3-4 hours of driving to establish normal system function. Do not replace any components if a “Side Detection System Temporarily Unavailable” message is displayed until it is confirmed that clearing a blockage did not correct the concern.

The rear cross traffic alert system will read the GPS latitude and longitude on the serial data bus and calculate if the vehicle is within a Radio Astronomy zone. These zones are located in Europe and Japan and require the sensors to be turned off. The “Side Detection System Unavailable” message will be displayed to the driver when this occurs.

Immobilizer

Schematic and Routing Diagrams

Immobilizer Schematics (Immobilizer)


LOC
DESC
T10UA Low Frequency Console Antenna
1
2
4996 BN/BK
4997 WH/GY
X227
32
33
X210
27
28
X4
7
14
+
-
Door Lock/ Indicator Schematics
745 GY
746 GY
747 GY
748 GY
6
2
A90 Logic
M74D Front Side Door Window Regulator Motor - Driver
M74P Front Side Door Window Regulator Motor - Passenger
S79LR Rear Side Door Window Switch - Left
S79RR Rear Side Door Window Switch - Right
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
K9 Body Control Module
K219 Lighting Control Module
F49DR
F30UA
F10UA
X1 12
X2 30
X6 22
X5 11
X3 12
X1 10
UTJ
728 GY
407 BK/YE
4064 BN/GN
28 BN/WH
312 YE
712 YE
Hood Latch Schematics
Horn Schematics
Headlights/ Daytime Running Lights (DRL) Schematics
5
6
B10D Sun Load and Ambient Light and Security Indicator Sensor
J210
HVAC Schematics
6846416

Description and Operation

Immobilizer Description and Operation

The immobilizer system functions are provided by the Steering Column Lock Module, the Body Control Module (BCM), and the Engine Control Module (ECM), as well as any control modules which store and report the environment identifier. The Body Control Module uses low frequency antennas in different locations on the vehicle to determine the location of the transmitter. Multiple transmitting antennas are used to ensure complete coverage of the vehicle interior and rear compartment. These antennas transmit to the keyless entry transmitter.

When the vehicle Stop/Start switch is pressed, the low frequency antennas emit a challenge to the keyless entry transmitter. The transmitter receives this challenge and emits it's response as an RF message. The BCM then compares this value to a value stored in memory. The BCM also monitors various control modules to determine if the stored environment identifiers match.

If the correct transponder is detected, the electric steering column is unlocked, and there is no start disable from OnStar the BCM will send the prerelease allowed message via serial data to the ECM. The vehicle will be allowed up to 3 seconds run time. If the theft check is incorrect, the environment identifier check fails, the incorrect transponder is detected, the electric steering column is locked, or there is a start disable from OnStar, the BCM will send a negative response and the ECM will not start the vehicle or will immediately shut off the vehicle if prerelease allowed the vehicle to start.

If RF communication is interrupted, a "No Remote Detected" message will be displayed on the DIC. In these cases, the transmitter can be placed in the transmitter pocket. The immobilizer coil antenna is located in the immediate vicinity of the transmitter pocket. Placing the transmitter in the pocket/slot will create a low powered coupling between the transmitter and immobilizer coil antenna, allowing communications to occur and enabling vehicle starting.

The components of the immobilizer system are as follows:

- BCM
- ECM
- Steering column lock control module
- Immobilizer coil antenna
- Low frequency antenna
- Ignition key/Keyless entry transmitter
- Security indicator
- Various control modules which store and report the environment identifier

Body Control Module (BCM)

The immobilizer system is an integral part of the BCM and is controlled internally within the BCM. The BCM can learn up to 8 keys (transponder values). The BCM uses low frequency antennas in three different locations on the vehicle to determine the location of the transmitter. Multiple antennas are used to ensure complete coverage of the vehicle interior and rear compartment. The BCM monitors the ignition mode switch. When the ignition mode is changed, the BCM will command, or “ping”, the low frequency antenna.

The BCM uses the following inputs:

- Environment identifier exchange with various modules
- Encrypted code from the vehicle key, received by the immobilizer coil antenna if the keyless entry transmitter signal isn’t detected as indicated by the “No Remote Detected” message
- Encrypted code from the vehicle key

The BCM uses the following outputs:

- Prerelease Allowed signal communication with ECM
- Challenge/Response with ECM

When a transponder value is received by the BCM, the BCM will compare this value to the learned key code stored in memory. The BCM then performs one of the following functions:

- If the encrypted code value matches the values stored in the BCM memory, the BCM will send the Prerelease Allowed signal to the ECM via serial data.
- If the encrypted code unique value does not match the value stored in the BCM, the BCM will send the start disable message to the ECM via serial data.
- If the BCM is unable to receive the vehicle key encrypted code value, the BCM will not send any messages to the ECM.

Engine Control Module (ECM)

The ECM receives the BCM Prerelease Allowed signal and simultaneously the ECM sends a challenge to the BCM via the serial data circuit upon seeing the vehicle transition from OFF to any other power mode. Both the ECM and BCM perform a calculation on this challenge. If the calculated response from the BCM equals the calculation performed by the ECM, the ECM will allow vehicle starting.

Low Frequency Antenna

When commanded, or “pinged”, the low frequency antenna broadcast a challenge to the keyless entry transmitter. Because of the low power of the antenna, this challenge is only broadcast in an approximate three meter range of the antenna. Multiple antenna are used to ensure complete coverage of the vehicle interior and rear compartment.

Steering Column Lock Control Module

On vehicles with electronic steering column lock that use a steering column lock control module the immobilizer system will prevent vehicle starting if there is a fault or no communication with the steering column lock control module.

Keyless Entry Transmitter

Each keyless entry transmitter contains a transponder with a unique encrypted value. The transponder's encrypted value is fixed and unable to be changed. The immobilizer system uses the keyless entry transmitter transponder value to determine if a valid keyless entry transmitter is being used to start the vehicle.

Security Indicator

The BCM will command the Instrument Cluster to illuminate the security indicator when the vehicle is ON to indicate a fault has occurred within the immobilizer system.

Remote Vehicle Speed Limiting Description and Operation

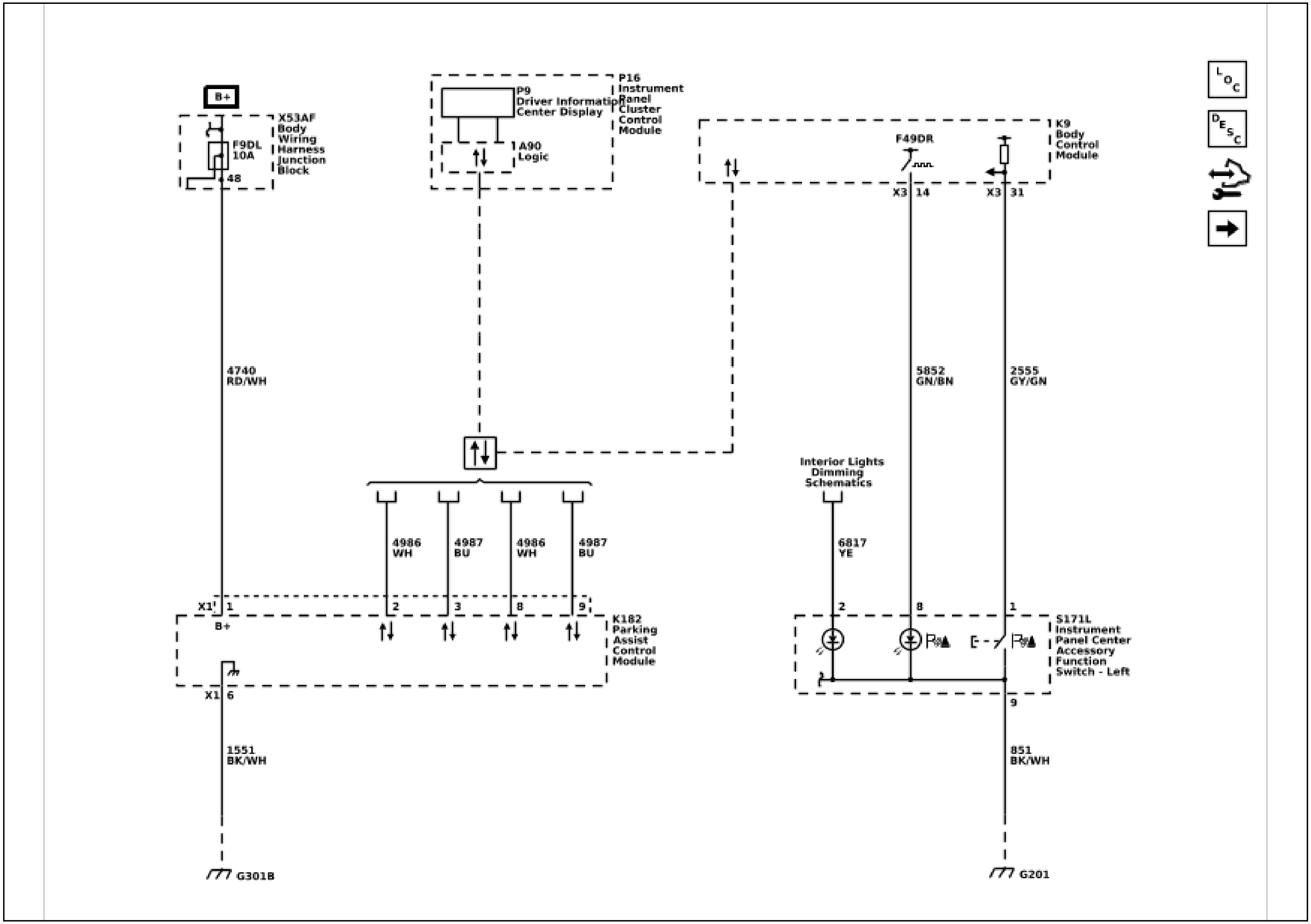
Certain vehicles equipped with OnStar® now have an additional feature that allows for remote limiting of the vehicle's speed. This OnStar® feature is called Stolen Vehicle Slow-Down and is now part of the OnStar® Stolen Vehicle Assistance service. This feature, when used in conjunction with local law enforcement and strict guidelines at the OnStar® Call Center, will slow the vehicle by interacting with the engine control system.

When the engine control system receives a valid request from the OnStar® telematics communications interface module, it will enter into a reduced engine power/vehicle speed limiting mode, which will decelerate the vehicle. Once the request is active the engine control module begins reducing engine torque to match requested vehicle speed and a REDUCED ENGINE POWER indication is displayed. No DTCs will be set during this process.

Parking Assistance Systems

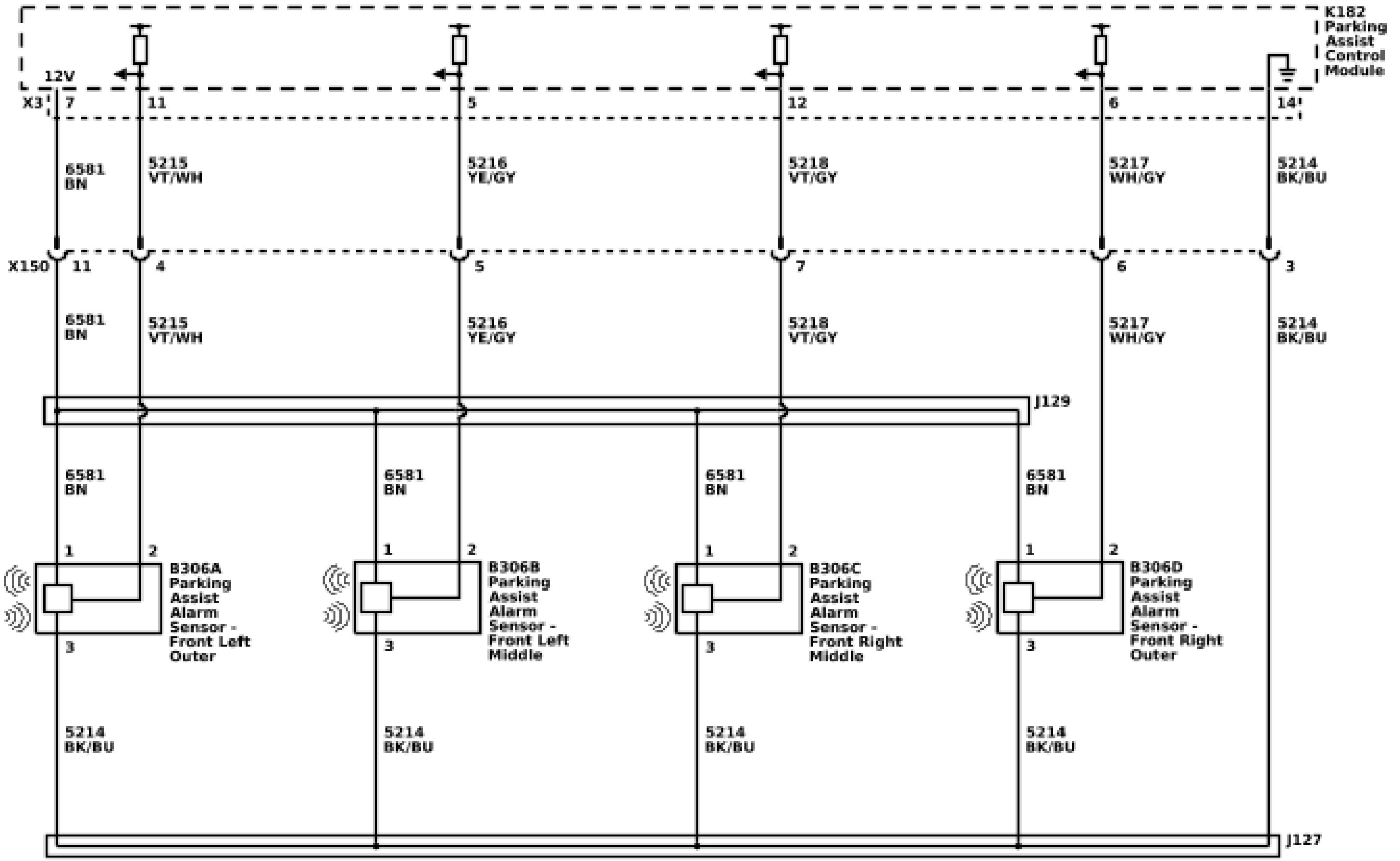
Schematic and Routing Diagrams

Parking Assistance Systems Schematics (Park Assist - Power, Ground, Serial Data, and Control (UD5))


B+
X53AF Body Wiring Harness Junction Block
F9DL 10A
48
4740 RD/WH
X1 1
B+
X1 6
1551 BK/WH
G301B
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
K9 Body Control Module
F49DR
X3 14
X3 31
5852 GN/BN
2555 GY/GN
4986 WH
4987 BU
4986 WH
4987 BU
2
3
8
9
K182 Parking Assist Control Module
Interior Lights Dimming Schematics
6817 YE
2
8
1
S171L Instrument Panel Center Accessory Function Switch - Left
9
851 BK/WH
G201

6846417

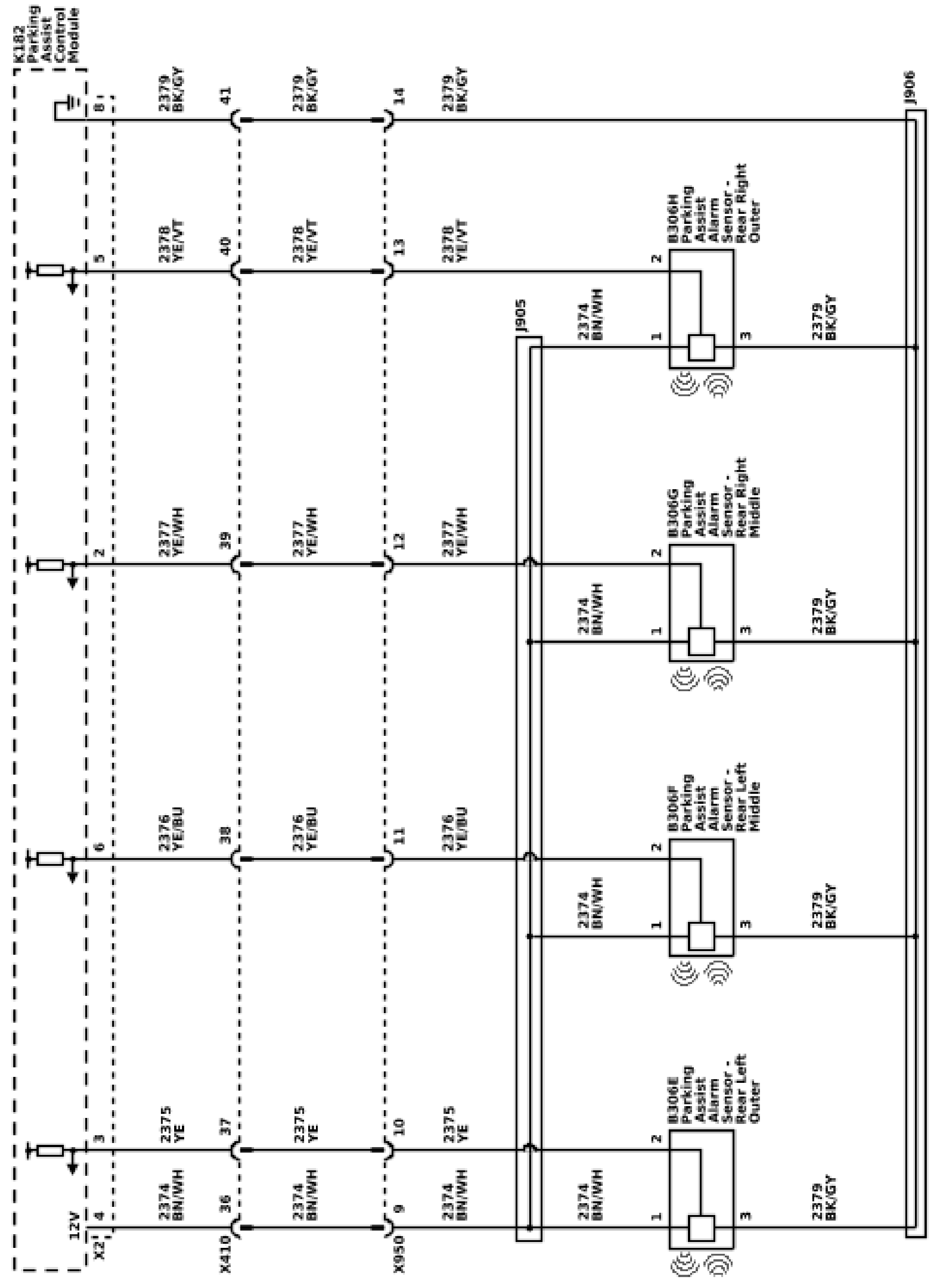
Parking Assistance Systems Schematics (Park Assist - Front Sensors (UD5))


K182 Parking Assist Control Module
12V
X3
7
11
5
12
6
14
6581 BN
5215 VT/WH
5216 YE/GY
5218 VT/GY
5217 WH/GY
5214 BK/BU
X150
11
4
5
7
6
3
6581 BN
5215 VT/WH
5216 YE/GY
5218 VT/GY
5217 WH/GY
5214 BK/BU
J129
6581 BN
6581 BN
6581 BN
6581 BN
1
2
B306A Parking Assist Alarm Sensor - Front Left Outer
3
1
2
B306B Parking Assist Alarm Sensor - Front Left Middle
3
1
2
B306C Parking Assist Alarm Sensor - Front Right Middle
3
1
2
B306D Parking Assist Alarm Sensor - Front Right Outer
3
5214 BK/BU
5214 BK/BU
5214 BK/BU
5214 BK/BU
J127

6846418

Parking Assistance Systems Schematics (Park Assist - Rear Sensors (UD5))

6846419


K182 Parking Assist Control Module
X2
X410
X950
12V
4
3
6
2
5
8
36
37
38
39
40
41
9
10
11
12
13
14
2374 BN/WH
2375 YE
2376 YE/BU
2377 YE/WH
2378 YE/VT
2379 BK/GY
J905
J906
1
2
3
B306E Parking Assist Alarm Sensor - Rear Left Outer
B306F Parking Assist Alarm Sensor - Rear Left Middle
B306G Parking Assist Alarm Sensor - Rear Right Middle
B306H Parking Assist Alarm Sensor - Rear Right Outer

Description and Operation

Parking Assist Description and Operation (UD5)

The parking assist system can help drivers avoid certain objects in their path during low-speed parking. The distance and location of the object is determined by four object sensors located in the rear fascia. The parking assist system may not detect all children, pedestrians, bicyclists, animals or objects below the bumper. Drivers should remember to always check the area around the vehicle before shifting into REVERSE. The parking assist system will not stop or slow down a vehicle. It does not engage a vehicle's throttle or braking. No safety system can take the place of an alert and engaged driver.

The parking assist system is made up of the following components:

- K182 Parking Assist Control Module
- B306 Parking Assist Alarm Sensors
- Infotainment system

K182 Parking Assist Control Module

The K182 Parking Assist Control Module provides a reference voltage and a low reference to the B166/B306 Parking Assist Alarm Sensors. The K182 Parking Assist Control Module receives individual signals from each of the four B166/B306 Parking Assist Alarm Sensors and determines the location and distance of an object based on these inputs. When an object is detected, the K182 Parking Assist Control Module will send a serial data message to the infotainment system requesting an audible alert.

B166/B306 Parking Assist Alarm Sensors

The B166/B306 Parking Assist Alarm Sensors are located in the rear fascia of the vehicle. The sensors are used to determine the distance between an object and the bumper. Each sensor emits an ultrasonic frequency which is reflected off any object located behind the vehicle. These reflections are received by the sensors. The time difference between the emission of the frequency and when the reflection is received is known as sensor echo time; it is used to determine the distance to the object. The sensors report this information to the K182 Parking Assist Control Module.

Infotainment System

The infotainment system controls the audible alert for the parking assist system. If the an object is detected the infotainment system will command beeps as an audible alert to the driver.

Rear Parking Assist Operation

The rear parking assist system uses four B166/B306 Parking Assist Alarm Sensors located on the rear fascia and functions when the transmission is in REVERSE. When a driver is backing up at a low speed, up to about 11 km/h (7 mph), the B166/B306 Parking Assist Alarm Sensors may detect objects up to 1.8 m (6 ft) behind the vehicle. When an object is within the measuring range of the B166/B306 Parking Assist Alarm Sensors, the ultrasonic pulse is reflected and is received by the sending or a neighboring sensor. The sensor converts this signal into a voltage signal and sends this signal to the K182 Parking Assist Control Module. The K182 Parking Assist Control Module evaluates the received sensor signals.

When an object is within 0.6 m (2 ft) of the rear bumper, 5 repeating low-pitched beeps are played from the rear speakers, followed by a continuous tone. If the vehicle is equipped with the Safety Alert Seat (HS1), it will pulse 5 times on both sides.

Some vehicles may have a park assist display on the P16 Instrument Panel Cluster Module with bars that show "distance to object," driving direction, and object location information for the parking assist system. As the vehicle gets closer to the detected object, distance-to-object information and caution triangles may be displayed that changes from yellow to amber to red.

The parking assist system can be turned on and off using the parking assist switch.

The K182 Parking Assist Control Module carries out a self test and monitors the sensors for electrical and mechanical faults. Monitored is the power supply of each sensor and the sensor signals. Mud, ice and snow may cause obstruction of the function of the sensors. The K182 Parking Assist Control Module also determines if the correct type of sensor is installed. If any of these tests fails, a DTC with corresponding symptom is set and the parking assist system is deactivated.

Parking Assist System Messages

SERVICE PARKING ASSIST or SERVICE DRIVER ASSIST

The driver information center displays SERVICE PARKING ASSIST or SERVICE DRIVER ASSIST when the K182 Parking Assist Control Module detects a malfunction in the parking assist system and the system is disabled.

PARK ASSIST OFF

The PARK ASSIST OFF message is displayed in the driver information center when the parking assist system is disabled due to conditions that disable or inhibit the system. The K182 Parking Assist Control Module requests the driver information center display PARK ASSIST OFF when it detects such a condition.

Parking Assist System Operational Checks

The scan tool Parking Assist Disable History 1–8 data can be used to diagnose a malfunction within the parking assist system or an intermittent concern. The following is a brief description of potential causes which may aid in diagnosis. For each potential issue, perform an appropriate inspect of the component or system and refer to the specific service information subsection related to that system for further diagnosis:

- Disable by Switch – The parking assist system has been disabled through the parking assist switch.
- Disabled by Customization Menu – The parking assist system has been disabled through the vehicle personalization menu.
- Vehicle Speed Too High – The vehicle is travelling too fast in reverse at speeds of greater than 8 km/h (5 mph).
- Vehicle Speed Invalid – The vehicle is unable to determine the vehicle speed.
- Steering Angle Signal Invalid – The vehicle is unable to determine the steering angle.
- Front Attached Object Detected – An object has been determined to be attached to the front of the vehicle. Common items such as a brush guards, light bars, and license plates may cause this concern. Additionally, damage to the front of the vehicle or a misaligned sensor may cause this concern. If the vehicle is damaged in a manner that causes the sensor to detect the bumper itself, the parking assist control module will interpret this as an attached object and disable the system. Carefully inspect the bumper, bumper mounting surface, and sensor retainers before continuing with normal diagnosis. After the detected cause has been addressed the vehicle must be driven at speed greater than 40 km/h (25 MPH).
- Rear Attached Object Detected – An object has been determined to be attached to the rear of the vehicle. Common items such as a hitch receiver, trailer, or a bicycle rack may cause this concern. Additionally, damage to the rear of the vehicle or a misaligned sensor may cause this concern. If the vehicle is damaged in a manner that causes the sensor to detect the bumper itself, the parking assist control module will interpret this as an attached object and disable the system. Carefully inspect the bumper, bumper mounting surface, and sensor retainers before continuing with normal diagnosis. After the detected cause has been addressed the vehicle must be driven at speed greater than 40 km/h (25 MPH).
- Front And Rear Attached Object Detected – An object has been determined to be attached to the front and rear of vehicle.
- Parking Assist Alarm Sensor Blocked – One of the following conditions may be present:
  - One or more of the sensors may be blocked by snow, mud, ice, or other debris. This might happen after going through a car wash in cold weather.
  - Silicone insulator surrounding sensor maybe missing, cut, or twisted.
  - Improperly installed sensor, sensor maybe be crooked due to a tight wire harness.
  - One or more of the sensors may be scratched or the paint maybe chipped.
  - Excessive paint thickness on a sensor may cause an excessive sensor ring time. When replacing or refinishing a sensor, do not apply an excessive amount of paint or clear coat.
- Haptic Seat Malfunction – A fault exists with the safety alert seat. Check for DTCs.
- Chime Malfunction – A fault exists with the vehicle chime. Check for DTCs.
- Parking Assist Switch Malfunction – A fault exists with the parking assist switch. Check for DTCs.
- Invalid Gear – The vehicle has determine a plausibility fault exists with the transmission range.
- Incorrect Power Mode – The vehicle is in an incorrect power mode for parking assist operation.

Parking Assist Description and Operation (UKZ)

Note: The automatic parking assist system can steer the vehicle automatically. Be aware that, in some unlikely situations, the vehicle steering wheel and wheels/tires may move without warning. Please be especially aware of situations when vehicle front tires are lifted above the ground on a vehicle hoist as the wheels could move without warning. Please exercise special care if any work is performed with the vehicle running and in gear while elevated on a hoist.

In addition to the eight B166/B306 Parking Assist Alarm Sensors used for front and rear park assist, the automatic parking assist system uses two additional B166/B306 Parking Assist Alarm Sensors located on the front fascia and two additional B166/B306 Parking Assist Alarm Sensors located on the rear fascia. These sensors face toward the side of the vehicle and are used to aid the driver in positioning the vehicle in a parallel parking maneuver.

Note: Any malfunction in the parking assist system may disable automatic parking assist. Automatic parking assist will not operate if the parking assist system is disabled.

Automatic Parking Assist Components

The parking assist system is made up of the following components:

- K182 Parking Assist Control Module
- K124 Image Processing Module
- B166/B306 Parking Assist Alarm Sensors
- K9 Body Control Module
- Parking Assist Switch
- Parking Assist Switch Indicator
- Automatic Parking Assist Switch
- Safety Alert Seat (with HS1)
- Infotainment System

K182 Parking Assist Control Module

The K182 Parking Assist Control Module provides a reference voltage and a low reference to the B166/B306 Parking Assist Alarm Sensors. The K182 Parking Assist Control Module receives individual signals from each of the four B166/B306 Parking Assist Alarm Sensors and determines the location and distance of an object based on these inputs. When an object is detected, the K182 Parking Assist Control Module will send a serial data message to the infotainment system requesting an audible alert.

B166/B306 Parking Assist Alarm Sensors

The B166/B306 Parking Assist Alarm Sensors are located in the front and rear fascia of the vehicle. The sensors are used to determine the distance between an object and the bumper. Each sensor emits an ultrasonic frequency which is reflected off any object located behind the vehicle. These reflections are received by the sensors. The time difference between the emission of the frequency and when the reflection is received is known as sensor echo time; it is used to determine the distance to the object. The sensors report this information to the K182 Parking Assist Control Module.

K9 Body Control Module

The K9 Body Control Module monitors the parking assist switch and control the parking assist switch indicator. When the parking assist switch is pressed, a serial data message is sent to the K182 Parking Assist Control Module indicating the driver is requesting the system be enabled or disabled. The K182 Parking Assist Control Module responds with a message that the system has been enabled or disabled. The K9 Body Control Module will respond by turning the parking assist switch indicator on or off.

The K9 Body Control Module also monitors the automatic parking assist switch. When the automatic parking assist switch is pressed, a serial data message is sent to the K182 Parking Assist Control Module indicating the driver is requesting the advance parking assist function. The K182 Parking Assist Control Module responds by beginning to search for a suitable parking space if conditions are correct.

On vehicles with HS1, without A45, the K9 Body Control Module also controls the P45 Seat Haptic Movement Motors for Safety Alert Seat operation.

Parking Assist Switch

The parking assist system can be activated and deactivated by pressing the parking assist switch. The K9 Body Control Module applies voltage and monitors the parking assist switch signal circuit. The parking assist switch is a normally open switch. With the switch open, voltage seen at the K9 Body Control Module is high. When the parking assist switch is pressed, the switch is closed and the signal circuit is pulled to ground. With the switch closed, voltage seen at the K9 Body Control Module is low. The K9 Body Control Module will respond to this by sending a serial data message to the K182 Parking Assist Control Module to enable or disable the system.

Parking Assist Switch Indicator

When the parking assist system is enabled, the K124 Image Processing Module will illuminate the indicator on the switch. The indicator is controlled through a low control circuit by the K124 Image Processing Module.

Automatic Parking Assist Switch

The automatic parking assist system can be activated and deactivated by pressing the automatic parking assist switch. The K9 Body Control Module applies voltage and monitors the automatic parking assist switch signal circuit. The automatic parking assist switch is a normally open switch. With the switch open, voltage seen at the K9 Body Control Module is high. When the automatic parking assist switch is pressed, the switch is closed and the signal circuit is pulled to ground. With the switch closed, voltage seen at the K9 Body Control Module is low. The K9 Body Control Module will respond to this by sending a serial data message to the K182 Parking Assist Control Module to enable or disable the system.

Safety Alert Seat (with HS1, without A45)

The K9 Body Control Module controls the P45 Seat Haptic Movement Motors. The P45 Seat Haptic Movement Motors provide haptic alert to the driver. If an object is detected, the K9 Body Control Module will command pulses to the P45 Seat Haptic Movement Motors as an alert to the driver.

Safety Alert Seat (with HS1 and A45)

The K40D Driver Seat Adjuster Memory Module controls the P45 Seat Haptic Movement Motors. The P45 Seat Haptic Movement Motors provide haptic alert to the driver. If an object is detected, the K40D Driver Seat Adjuster Memory Module will command pulses to the P45 Seat Haptic Movement Motors as an alert to the driver.

Infotainment System
The infotainment system controls the audible alert for the parking assist system. If the an object is detected the infotainment system will command beeps as an audible alert to the driver.

Parking Assist Operation

The rear parking assist system uses four B166/B306 Parking Assist Alarm Sensors located on the rear fascia and functions when the transmission is in REVERSE. When a driver is backing up at a low speed, up to about 11 km/h (7 mph), the B166/B306 Parking Assist Alarm Sensors may detect objects up to 1.8 m (6 ft) behind the vehicle. When an object is within the measuring range of the B166/B306 Parking Assist Alarm Sensors, the ultrasonic pulse is reflected and is received by the sending or a neighboring sensor. The sensor converts this signal into a voltage signal and sends this signal to the K182 Parking Assist Control Module. The K182 Parking Assist Control Module evaluates the received sensor signals.

When an object is within 0.6 m (2 ft) of the rear bumper, 5 repeating low-pitched beeps are played from the rear speakers, followed by a continuous tone. If the vehicle is equipped with the Safety Alert Seat (HS1), it will pulse 5 times on both sides.

The front parking assist system uses four B306 Parking Assist Alarm Sensors located on the front fascia and functions when the vehicle is moving forward at low speeds. When a driver is driving forward at a low speed, up to about 11 km/h (7 mph), the B166/B306 Parking Assist Alarm Sensors may detect objects up to 1.8 m (6 ft) in front of the vehicle. When an object is within the measuring range of the B166/B306 Parking Assist Alarm Sensors, the ultrasonic pulse is reflected and is received by the sending or a neighboring sensor. The sensor converts this signal into a voltage signal and sends this signal to the K182 Parking Assist Control Module. The K182 Parking Assist Control Module evaluates the received sensor signals.

When an object is within 0.3 m (1 ft) of the front bumper, 5 repeating low-pitched beeps are played from the front speakers, followed by a continuous tone. If the vehicle is equipped with the Safety Alert Seat (HS1), it will pulse 5 times on both sides. The tone for front parking assist is higher pitched than the tone for rear parking assist.

Some vehicles may have a park assist display on the P16 Instrument Panel Cluster Module with bars that show "distance to object," driving direction, and object location information for the parking assist system. As the vehicle gets closer to the detected object, distance-to-object information and caution triangles may be displayed that changes from yellow to amber to red.

The parking assist system can be turned on and off using the parking assist switch.

The K182 Parking Assist Control Module carries out a self test and monitors the sensors for electrical and mechanical faults. Monitored is the power supply of each sensor and the sensor signals. Mud, ice and snow may cause obstruction of the function of the sensors. The K182 Parking Assist Control Module also determines if the correct type of sensor is installed. If any of these tests fails, a DTC with corresponding symptom is set and the parking assist system is deactivated.

Automatic Parking Assist Operation

The automatic parking assist system aids the driver when attempting a parking maneuver. The K182 Parking Assist Control Module uses the four additional side-facing B306 Parking Assist Alarm Sensors located in the front and rear fascia, along with the eight typical forward and rearward-facing B306 Parking Assist Alarm Sensors, to guide the driver into a parking space.

Note: The driver seat belt must be buckled for the Automatic Parking Assist to operate. Unbuckling the seat belt during Automatic Parking Assist operation can cause the system to stop and not complete the parking maneuver.

The automatic parking assist switch is used to initiate the parking assist system when traveling at speeds below approximately 30 km/h (18 mph) (refer to owners manual for exact speed). While driving along a row of vehicles in which the driver wishes to park, the parking assist is activated by a switch or the infotainment screen. This will enable the automatic parking assist system and the K182 Parking Assist Control Module will begin seeking potential parking spots using the B306 Parking Assist Alarm Sensors.

When a parking spot of suitable size is found, the K182 Parking Assist Control Module will display a stop message on the driver information center. The driver accepts the decision by stopping the vehicle. The system calculates the optimal path into the parking spot and will then guide the vehicle into the chosen spot by taking over the shifting, steering, and braking control from the driver. Once in the parking spot, the K182 Parking Assist Control Module will center the vehicle in the spot.

If the automatic parking assist system is unable to complete a parking maneuver, a message indicating that the maneuver has been aborted will be displayed on the driver information center. Vehicle control will be given back to the driver once the brake or parking brake is applied.

Parking Assist System Messages

SERVICE PARKING ASSIST or SERVICE DRIVER ASSIST

The driver information center displays SERVICE PARKING ASSIST or SERVICE DRIVER ASSIST when the K182 Parking Assist Control Module detects a malfunction in the parking assist system and the system is disabled.

PARK ASSIST OFF

The PARK ASSIST OFF message is displayed in the driver information center when the parking assist system is disabled due to conditions that disable or inhibit the system. The K182 Parking Assist Control Module requests the driver information center display PARK ASSIST OFF when it detects such a condition.

Parking Assist System Operational Checks

The scan tool Parking Assist Disable History 1–8 data can be used to diagnose a malfunction within the parking assist system or an intermittent concern. The following is a brief description of potential causes which may aid in diagnosis. For each potential issue, perform an appropriate inspect of the component or system and refer to the specific service information subsection related to that system for further diagnosis:

- Disable by Switch – The parking assist system has been disabled through the parking assist switch.
- Disabled by Customization Menu – The parking assist system has been disabled through the vehicle personalization menu. Note: the Parking Assist system customization menu may not be available on all vehicles based on vehicle option content.
- Vehicle Speed Too High – The vehicle is travelling too fast in reverse at speeds of greater than 8 km/h (5 mph).
- Vehicle Speed Invalid – The vehicle is unable to determine the vehicle speed.
- Steering Angle Signal Invalid – The vehicle is unable to determine the steering angle.
- Front Attached Object Detected – An object has been determined to be attached to the front of the vehicle. Common items such as a brush guards, light bars, and license plates may cause this concern. Additionally, damage to the front of the vehicle or a misaligned sensor may cause this concern. If the vehicle is damaged in a manner that causes the sensor to detect the bumper itself, the parking assist control module will interpret this as an attached object and disable the system. Carefully inspect the bumper, bumper mounting surface, and sensor retainers before continuing with normal diagnosis. After the detected cause has been addressed the vehicle must be driven at speed greater than 40 km/h (25 MPH).
- Rear Attached Object Detected – An object has been determined to be attached to the rear of the vehicle. Common items such as a hitch receiver, trailer, or a bicycle rack may cause this concern. Additionally, damage to the rear of the vehicle or a misaligned sensor may cause this concern. If the vehicle is damaged in a manner that causes the sensor to detect the bumper itself, the parking assist control module will interpret this as an attached object and disable the system. Carefully inspect the bumper, bumper mounting surface, and sensor retainers before continuing with normal diagnosis. After the detected cause has been addressed the vehicle must be driven at speed greater than 40 km/h (25 MPH).
- Front And Rear Attached Object Detected – An object has been determined to be attached to the front and rear of vehicle.
- Parking Assist Alarm Sensor Blocked – One of the following conditions may be present:
  - One or more of the sensors may be blocked by snow, mud, ice, or other debris. This might happen after going through a car wash in cold weather.
  - Silicone insulator surrounding sensor maybe missing, cut, or twisted.
  - Improperly installed sensor, sensor maybe be crooked due to a tight wire harness.
  - One or more of the sensors may be scratched or the paint maybe chipped.
  - Excessive paint thickness on a sensor may cause an excessive sensor ring time. When replacing or refinishing a sensor, do not apply an excessive amount of paint or clear coat.
- Haptic Seat Malfunction – A fault exists with the safety alert seat. Check for DTCs.
- Chime Malfunction – A fault exists with the vehicle chime. Check for DTCs.
- Parking Assist Switch Malfunction – A fault exists with the parking assist switch. Check for DTCs.
- Invalid Gear – The vehicle has determine a plausibility fault exists with the transmission range.
- Incorrect Power Mode – The vehicle is in an incorrect power mode for parking assist operation.

Automatic Parking Assist System Operational Checks

The scan tool Automatic Parking Assist Disable History 1–8 data can be used to diagnose a malfunction within the parking assist system or an intermittent concern. The following is a brief description of potential causes which may aid in diagnosis. For each potential issue, perform an appropriate inspect of the component or system and refer to the specific service information subsection related to that system for further diagnosis:

- Automatic Parking Assist Switch Pressed – The automatic parking assist switch has been pressed a second time, aborting the function.
- Automatic Parking Assist Switch Malfunction – The automatic parking assist is stuck closed or has been held down.
- Interrupted by Driver – The Automatic parking assist operation has been aborted by the driver by interfacing with the steering, brake, or accelerator.
- Info Display Control Malfunction – The Automatic parking assist system is not able to provide instructions on the driver information center
- Door Open – A door has been opened.
- Parking Brake Malfunction – A malfunction has been detected in the electric parking brake system.
- Vehicle Dynamics System Status Not Plausible – An implausible scenario between the steering angle sensor, yaw sensor, and lateral/longitudinal accelerometer has been determined.
- Steering Response Malfunction – The steering system has not responded as expected to a steering command.
- Automatic Brake Response Malfunction
- Transmission Response Malfunction – The transmission has not responded as expected to a shift command.
- Automatic Braking Apply Response Not Plausible – An implausible scenario between a brake apply command and vehicle deceleration has been determined.
- Vehicle Movement Detected During Brake Applied Request – Vehicle movement has occurred while the brakes are commanded to apply.
- Chime Malfunction – A fault exists with the vehicle chime. Check for DTCs.
- Wheel Speed Direction Signal Invalid – Identified wheel directional travel does not match intended travel direction.
- Vehicle Speed Invalid – The vehicle is unable to determine the vehicle speed.
- Attached Object Detected – An object has been determined to be attached to the front and rear of vehicle.
- Parking Maneuver Vehicle Speed Exceeded – The vehicle has exceeded the maximum allowable speed for the parking maneuver.
- Vehicle Speed Too High to Search for a Parking Space – The vehicle has exceeded the maximum allowable speed to search for a suitable parking spot.
- Number of Parking Maneuvers Exceeded – The maximum number of parking attempts for a single maneuver has been exceeded.
- Parking Space Too Small – The vehicle has determined the space for the attempted parking maneuver is too small.
- Vehicle Not Following Parking Space Path – The vehicle is unable to follow the intended path of the parking maneuver.
- Yaw Angle Above Threshold – The expected yaw angle for the parking maneuver has been exceeded.
- Steering Angle Deviation Above Threshold – The expected steering angle for the parking maneuver has been exceeded.
- Object Detected on Both Sides of Vehicle – An object has been detected on both the left and right side of the vehicle.
- Object Detected in Alert Zone – An object has been detected in the vehicle’s path.
- Sensor Blocked – One of the following conditions may be present:
  - One or more of the sensors may be blocked by snow, mud, ice, or other debris. This might happen after going through a car wash in cold weather.
  - Silicone insulator surrounding sensor maybe missing, cut, or twisted.
  - Improperly installed sensor, sensor maybe be crooked due to a tight wire harness.
  - One or more of the sensors may be scratched or the paint maybe chipped.
  - Excessive paint thickness on a sensor may cause an excessive sensor ring time. When replacing or refinishing a sensor, do not apply an excessive amount of paint or clear coat.
- Steering Angle Signal Invalid – The vehicle is unable to determine the steering angle.
- Invalid Gear – The vehicle has determine a plausibility fault exists with the transmission range.
- Incorrect Power Mode – The vehicle is in an incorrect power mode for parking assist operation.

Parking Assist Description and Operation (UD7)

The parking assist system can help drivers avoid certain objects in their path during low-speed parking. The distance and location of the object is determined by four object sensors located in the rear fascia. The parking assist system may not detect all children, pedestrians, bicyclists, animals or objects below the bumper. Drivers should remember to always check the area around the vehicle before shifting into REVERSE. The parking assist system will not stop or slow down a vehicle. It does not engage a vehicle's throttle or braking. No safety system can take the place of an alert and engaged driver.

The parking assist system is made up of the following components:

- K182 Parking Assist Control Module
- B306 Parking Assist Alarm Sensors
- K9 Body Control Module
- Parking Assist Switch
- Parking Assist Switch Indicator
- Safety Alert Seat (with HS1)
- Infotainment system

K182 Parking Assist Control Module
The K182 Parking Assist Control Module provides a reference voltage and a low reference to the B306 Parking Assist Alarm Sensors. The K182 Parking Assist Control Module receives individual signals from each of the four B306 Parking Assist Alarm Sensors and determines the location and distance of an object based on these inputs. When an object is detected, the K182 Parking Assist Control Module will send a serial data message to the infotainment system requesting an audible alert.

B306 Parking Assist Alarm Sensors
The B306 Parking Assist Alarm Sensors are located in the rear fascia of the vehicle. The sensors are used to determine the distance between an object and the bumper. Each sensor emits an ultrasonic frequency which is reflected off any object located behind the vehicle. These reflections are received by the sensors. The time difference between the emission of the frequency and when the reflection is received is known as sensor echo time; it is used to determine the distance to the object. The sensors report this information to the K182 Parking Assist Control Module.

K9 Body Control Module
The K9 Body Control Module monitors the parking assist switch and control the parking assist switch indicator. When the parking assist switch is pressed, a serial data message is sent to the K182 Parking Assist Control Module indicating the driver is requesting the system be enabled or disabled. The K182 Parking Assist Control Module responds with a message that the system has been enabled or disabled. The K9 Body Control Module will respond by turning the parking assist switch indicator on or off.

On vehicles with HS1, without A45, the K9 Body Control Module also controls the P45 Seat Haptic Movement Motors for Safety Alert Seat operation.

Parking Assist Switch
The parking assist system can be activated and deactivated by pressing the parking assist switch. TheK9 Body Control Module applies voltage and monitors the parking assist switch signal circuit. The parking assist switch is a normally open switch. With the switch open, voltage seen at the K9 Body Control Module is high. When the parking assist switch is pressed, the switch is closed and the signal circuit is pulled to ground. With the switch closed, voltage seen at the K9 Body Control Module is low. The K9 Body Control Module will respond to this by sending a serial data message to the K182 Parking Assist Control Module to enable or disable the system.

Parking Assist Switch Indicator
When the parking assist system is enabled, the K9 Body Control Module will illuminate the indicator on the switch. The indicator receives a constant ground and is controlled through a PWM voltage control circuit by the K9 Body Control Module.

Safety Alert Seat (with HS1, without A45)
The K9 Body Control Module controls the P45 Seat Haptic Movement Motors. The P45 Seat Haptic Movement Motors provide haptic alert to the driver. If an object is detected, the K9 Body Control Module will command pulses to the P45 Seat Haptic Movement Motors as an alert to the driver.

Safety Alert Seat (with HS1 and A45)
The K40D Driver Seat Adjuster Memory Module controls the P45 Seat Haptic Movement Motors. The P45 Seat Haptic Movement Motors provide haptic alert to the driver. If an object is detected, the K40D Driver Seat Adjuster Memory Module will command pulses to the P45 Seat Haptic Movement Motors as an alert to the driver.

Infotainment System
The infotainment system controls the audible alert for the parking assist system. If the an object is detected the infotainment system will command beeps as an audible alert to the driver.

Rear Parking Assist Operation

The rear parking assist system uses four B306 Parking Assist Alarm Sensors located on the rear fascia and functions when the transmission is in REVERSE. When a driver is backing up at a low speed, up to about 11 km/h (7 mph), the B306 Parking Assist Alarm Sensors may detect objects up to 1.8 m (6 ft) behind the vehicle. When an object is within the measuring range of the B306 Parking Assist Alarm Sensors, the ultrasonic pulse is reflected and is received by the sending or a neighboring sensor. The sensor converts this signal into a voltage signal and sends this signal to the K182 Parking Assist Control Module. The K182 Parking Assist Control Module evaluates the received sensor signals.

When an object is within 0.6 m (2 ft) of the rear bumper, 5 repeating low-pitched beeps are played from the rear speakers, followed by a continuous tone. If the vehicle is equipped with the Safety Alert Seat (HS1), it will pulse 5 times on both sides.

Some vehicles may have a park assist display on the P16 Instrument Panel Cluster Module with bars that show "distance to object," driving direction, and object location information for the parking assist system. As the vehicle gets closer to the detected object, distance-to-object information and caution triangles may be displayed that changes from yellow to amber to red.

The parking assist system can be turned on and off using the parking assist switch.

The K182 Parking Assist Control Module carries out a self test and monitors the sensors for electrical and mechanical faults. Monitored is the power supply of each sensor and the sensor signals. Mud, ice and snow may cause obstruction of the function of the sensors. The K182 Parking Assist Control Module also determines if the correct type of sensor is installed. If any of these tests fails, a DTC with corresponding symptom is set and the parking assist system is deactivated.

Parking Assist System Messages

SERVICE PARKING ASSIST or SERVICE DRIVER ASSIST

The driver information center displays SERVICE PARKING ASSIST or SERVICE DRIVER ASSIST when the K182 Parking Assist Control Module detects a malfunction in the parking assist system and the system is disabled.

PARK ASSIST OFF

The PARK ASSIST OFF message is displayed in the driver information center when the parking assist system is disabled due to conditions that disable or inhibit the system. The K182 Parking Assist Control Module requests the driver information center display PARK ASSIST OFF when it detects such a condition.

Parking Assist System Operational Checks

The scan tool Parking Assist Disable History 1–8 data can be used to diagnose a malfunction within the parking assist system or an intermittent concern. The following is a brief description of potential causes which may aid in diagnosis. For each potential issue, perform an appropriate inspect of the component or system and refer to the specific service information subsection related to that system for further diagnosis:

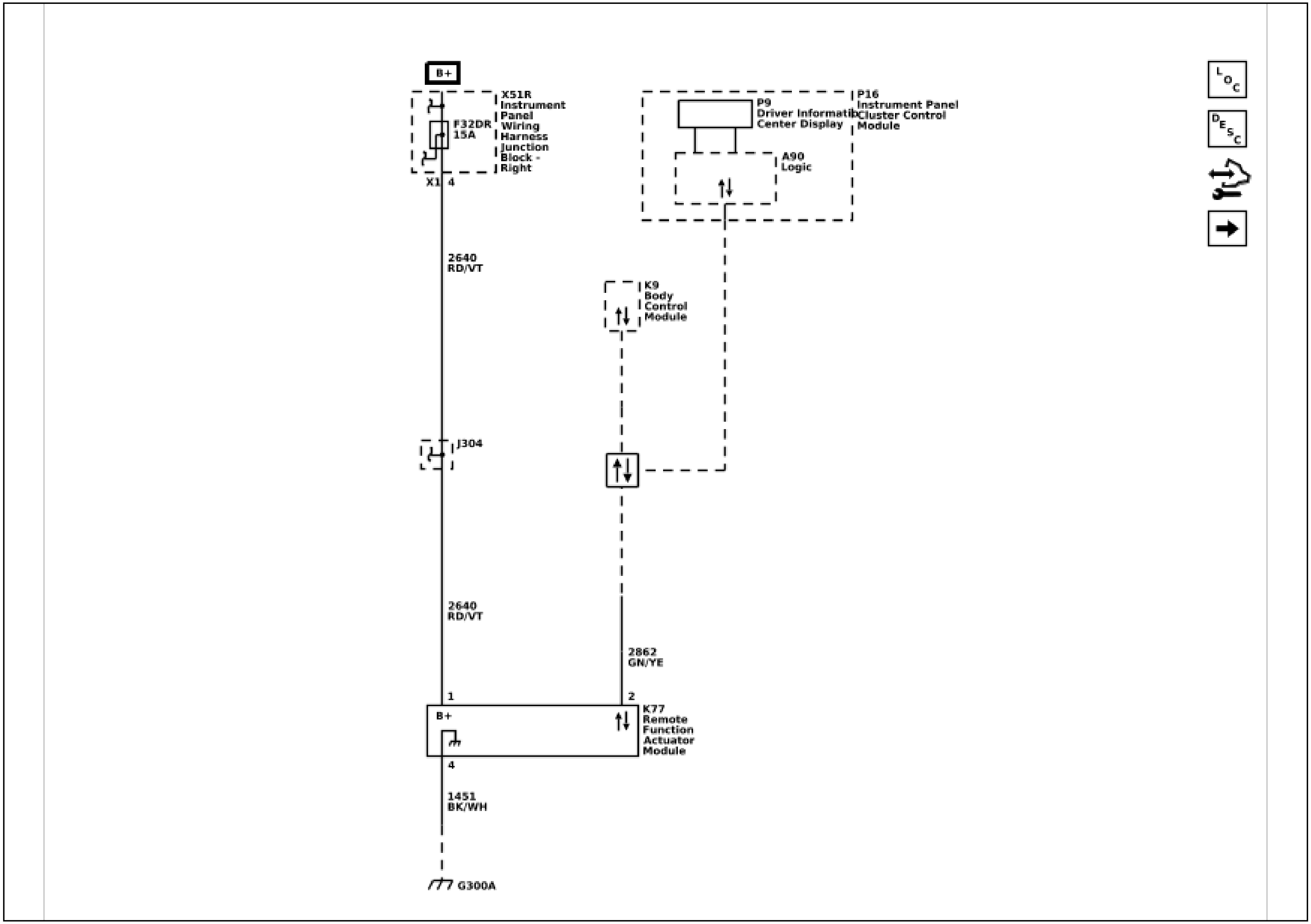
- Disable by Switch – The parking assist system has been disabled through the parking assist switch.
- Disabled by Customization Menu – The parking assist system has been disabled through the vehicle personalization menu. Note: the Parking Assist system customization menu may not be available on all vehicles based on vehicle option content.
- Vehicle Speed Too High – The vehicle is travelling too fast in reverse at speeds of greater than 8 km/h (5 mph).
- Vehicle Speed Invalid – The vehicle is unable to determine the vehicle speed.
- Steering Angle Signal Invalid – The vehicle is unable to determine the steering angle.
- Front Attached Object Detected – An object has been determined to be attached to the front of the vehicle. Common items such as brush guards, light bars, and license plates may cause this concern. Additionally, damage to the front of the vehicle or a misaligned sensor may cause this concern. If the vehicle is damaged in a manner that causes the sensor to detect the bumper itself, the parking assist control module will interpret this as an attached object and disable the system. Carefully inspect the bumper, bumper mounting surface, and sensor retainers before continuing with normal diagnosis. After the detected cause has been addressed the vehicle must be driven at speed greater than 40 km/h (25 MPH).
- Rear Attached Object Detected – An object has been determined to be attached to the rear of the vehicle. Common items such as a hitch receiver, trailer, or a bicycle rack may cause this concern. Additionally, damage to the rear of the vehicle or a misaligned sensor may cause this concern. If the vehicle is damaged in a manner that causes the sensor to detect the bumper itself, the parking assist control module will interpret this as an attached object and disable the system. Carefully inspect the bumper, bumper mounting surface, and sensor retainers before continuing with normal diagnosis. After the detected cause has been addressed the vehicle must be driven at speed greater than 40 km/h (25 MPH).

- Front And Rear Attached Object Detected – An object has been determined to be attached to the front and rear of vehicle.
- Parking Assist Alarm Sensor Blocked – One of the following conditions may be present:
  - One or more of the sensors may be blocked by snow, mud, ice, or other debris. This might happen after going through a car wash in cold weather.
  - Silicone insulator surrounding sensor maybe missing, cut, or twisted.
  - Improperly installed sensor, sensor maybe be crooked due to a tight wire harness.
  - One or more of the sensors may be scratched or the paint maybe chipped.
  - Excessive paint thickness on a sensor may cause an excessive sensor ring time. When replacing or refinishing a sensor, do not apply an excessive amount of paint or clear coat.
- Haptic Seat Malfunction – A fault exists with the safety alert seat. Check for DTCs.
- Chime Malfunction – A fault exists with the vehicle chime. Check for DTCs.
- Parking Assist Switch Malfunction – A fault exists with the parking assist switch. Check for DTCs.
- Invalid Gear – The vehicle has determine a plausibility fault exists with the transmission range.
- Incorrect Power Mode – The vehicle is in an incorrect power mode for parking assist operation.

Remote Functions

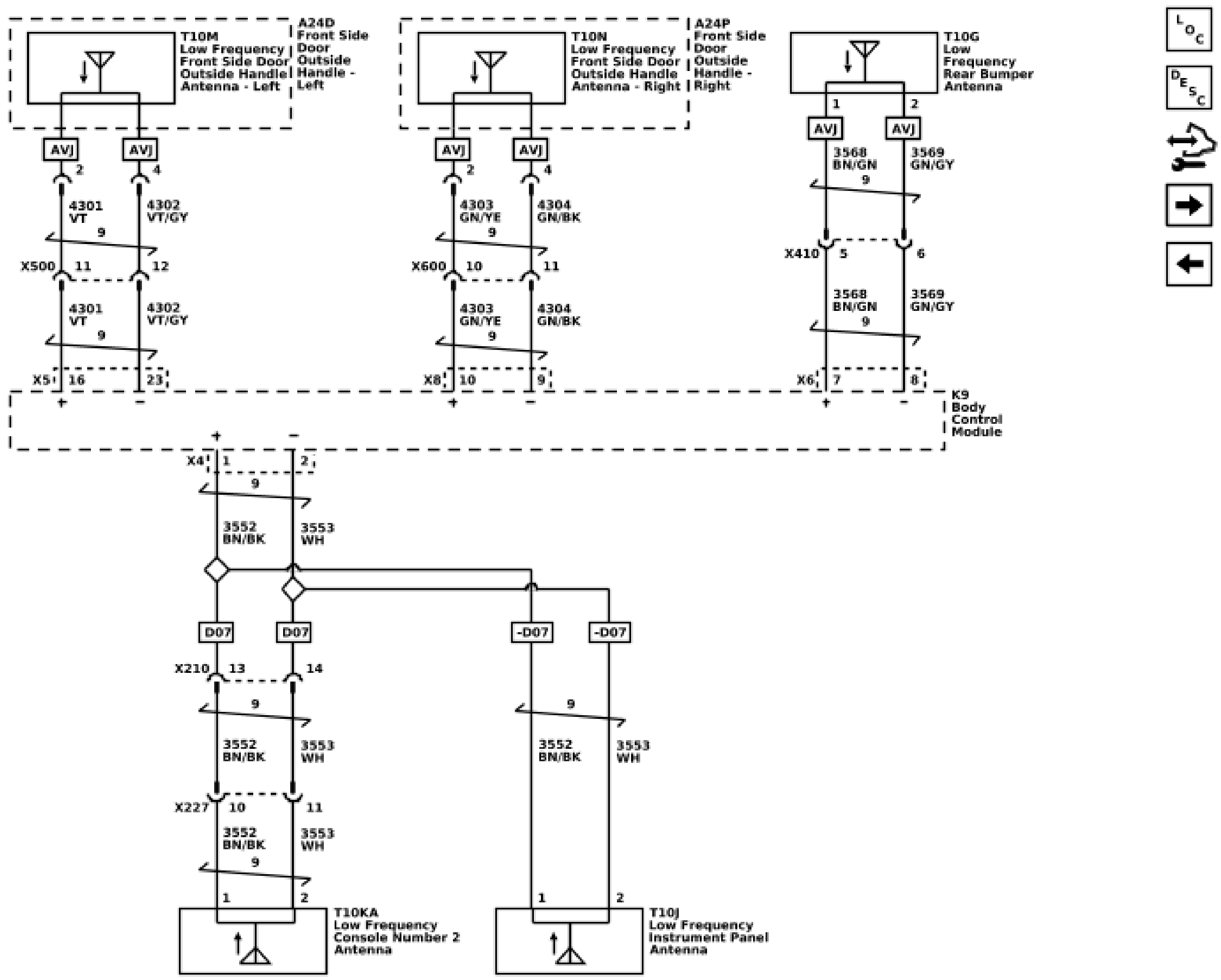
Schematic and Routing Diagrams

Remote Function Schematics (Keyless Entry (AQQ / AVJ))


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F32DR 15A
X1 4
2640 RD/VT
J304
2640 RD/VT
1
B+
K77 Remote Function Actuator Module
4
1451 BK/WH
G300A
P9 Driver Information Center Display
P16 Instrument Panel Cluster Control Module
A90 Logic
K9 Body Control Module
2862 GN/YE
2
L O C
D E S C

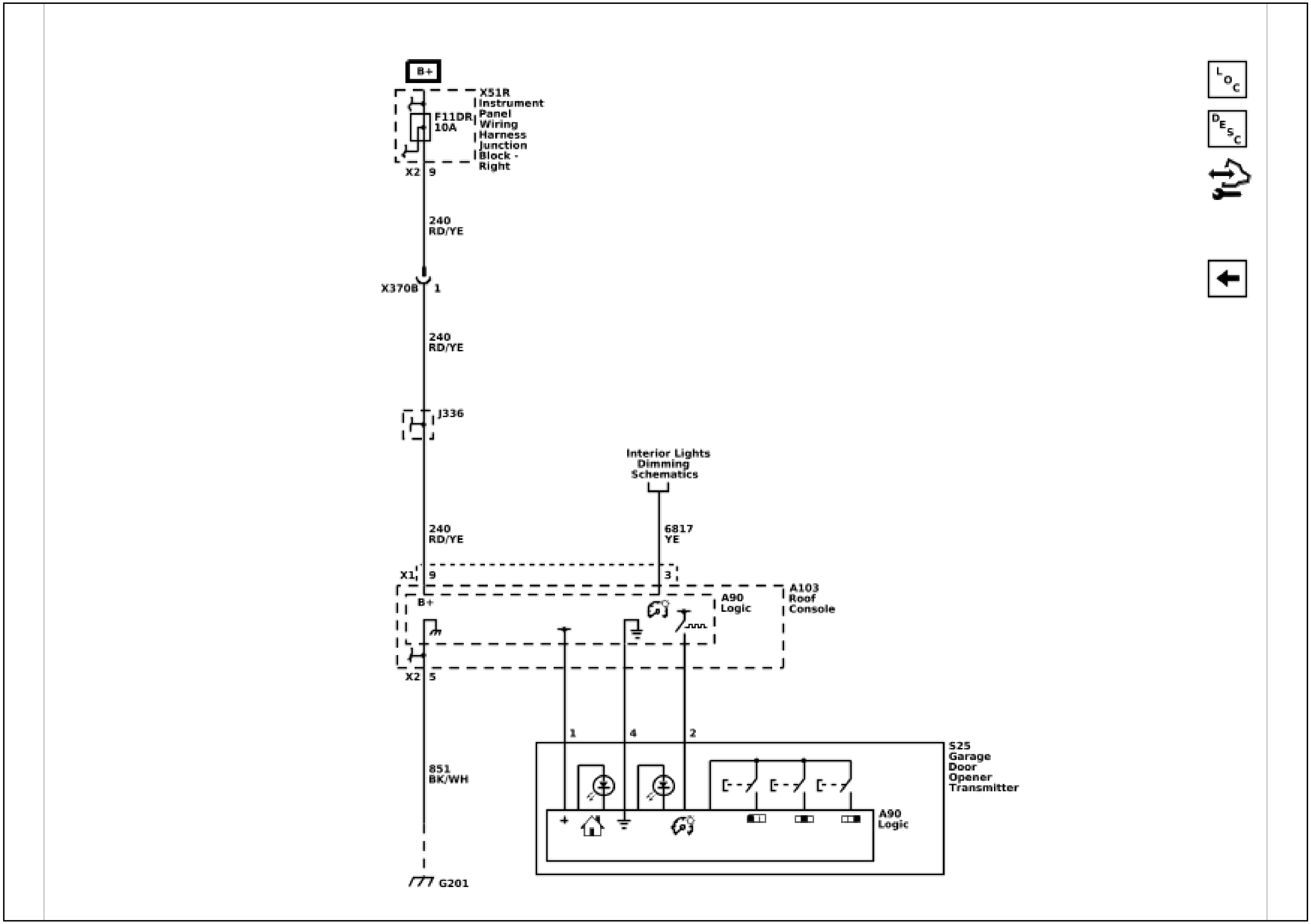
6846420

Remote Function Schematics (Keyless Entry - Passive and Keyless Start)


T10M
Low Frequency
Front Side Door
Outside Handle
Antenna - Left
A24D
Front Side
Door
Outside
Handle -
Left
T10N
Low Frequency
Front Side Door
Outside Handle
Antenna - Right
A24P
Front Side
Door
Outside
Handle -
Right
T10G
Low
Frequency
Rear Bumper
Antenna
AVJ
4301
VT
4302
VT/GY
4303
GN/YE
4304
GN/BK
3568
BN/GN
3569
GN/GY
X500
X600
X410
X5
X8
X6
K9
Body
Control
Module
X4
3552
BN/BK
3553
WH
D07
-D07
X210
X227
T10KA
Low Frequency
Console Number 2
Antenna
T10J
Low Frequency
Instrument Panel
Antenna

6846421

Remote Function Schematics (Garage Door Opener (UG1))


B+
X51R
Instrument
Panel
Wiring
Harness
Junction
Block -
Right
F11DR
10A
X2 9
240
RD/YE
X370B 1
240
RD/YE
J336
Interior Lights
Dimming
Schematics
6817
YE
240
RD/YE
X1 9
3
B+
A90
Logic
A103
Roof
Console
X2 5
1
4
2
851
BK/WH
G201
S25
Garage
Door
Opener
Transmitter
+
A90
Logic

6846422

Description and Operation

Front Side Door Access Control Transmitter Description and Operation

Front Side Door Access Control Transmitter Description and Operation

The Front Side Door Access Control Transmitter is an accessory offered to be used as a vehicle entry device. Similar to the Keyless Entry Transmitter, the Front Side Door Access Control Transmitter will send a radio frequency signal to the Remote Function Actuator. Next, the Remote Function Actuator sends a signal to the Body Control Module via LIN communication. The BCM will interpret this signal and either lock or unlock the vehicle as a result. A low transmitter battery or radio frequency interference from aftermarket devices, such as 2-way radios, power inverters, computers, etc., may cause a system malfunction. High radio frequency traffic areas, such as gas stations that use pay-at-the-pump radio frequency transponders, may also cause interference that could lead to a malfunction.

Like the Keyless Entry Transmitter, the Front Side Door Access Control Transmitter is programmed to the vehicle's Body Control Module. This means the Front Side Door Access Control Transmitter will populate one of the 8 programmable spaces in the BCM for Keyless Entry Transmitters. The Front Side Door Access Control Transmitter will need to be reprogrammed in the event of BCM replacement. This can only be achieved with the Master Code. If the Master Code is not retrievable, a new Front Side Door Access Control Transmitter with accompanying wallet card will need to be programmed to the new BCM.

The Front Side Door Access Control Transmitter has 5 buttons depicting numbers from 0 to 9. Each button represents a character of a 5 digit code that the vehicle owner may program, which will be referred to as a personal code. The user has 3 attempts to input the correct access code before the Front Side Door Access Control Transmitter enters lockout mode for 1 minute. This will occur up to 2 more times if the incorrect access code is entered repeatedly. After that, any additional 3 attempts will cause the Front Side Door Access Control Transmitter to enter lockout mode for 23 minutes. There is an LED light at the top of the Front Side Door Access Control Transmitter that provides feedback to the user. Each Front Side Door Access Control Transmitter is sold with a wallet card that contains a master code that may be used for keyless entry as well as programming a personal code. The master code will always allow operation of the Front Side Door Access Control Transmitter and may be used to program a new personal code. Entering the 5 digit access code will unlock the driver door. Pressing the 3/4 key within 5 seconds of entering the 5 digit access code with unlock all doors. Pressing the 7/8 and 9/0 button will lock all doors. To change the personal code, refer to the wallet card included with the Front Side Door Access Control Transmitter.

The Front Side Door Access Control Transmitter contains a button cell battery that is not serviceable. Once the battery exceeds the expected lifetime, the Front Side Door Access Control Transmitter will need to be replaced. A new Front Side Door Access Control Transmitter will come with new wallet card.

Garage Door Opener Description and Operation

The garage door opener is fixed and rolling code capable. Rolling code is a system that allows the code that the customers receiver receives from the garage door opener to change every time the garage door opener is used within operating range of the receiver. Rolling code programming requires the customer to push a learn/program button on the garage door opener receiver at their home. This button is usually located on the receiver unit under a cover (light cover) on one end of the unit. The customer must follow the garage door opener manufacturers instructions to program/learn the receiver to accept the Universal Home Remote System as an authorized opener for their unit . When the receiver and the garage door opener are initially programmed together, a code is established and a new code is created for every new transmission. The software in the receiver recognizes the garage door opener and accepts the new code.

The garage door opener is compatible with most, but not all types and brands of transmitters.

The garage door opener is a transmitter operating between 288–434 MHz. The power and range of the transmitter is limited to comply with laws governing the generation of radio frequency interference. The transmitter is programmed by the user to accept the signal generated by the user's transmitters.

The garage door opener has 3 buttons that may be programmed for individual transmitter/receiver combinations to control up to 3 garage door openers, security gates, lighting systems, etc. Each button represents a transmitter code section of the transmitter, which operates separately from any other button, and may be considered a separate transmitter. Operation consists of simply pressing a button to activate the corresponding transmitter.

The garage door opener does not need any programming after it is replaced. However, for the opener function it must be programmed to the customer’s garage door or other devices such as a gate. The programming can only be performed at the device being programmed, it cannot be programmed at a service facility. Instructions for programming are listed in the Garage Door Opener Malfunction document in a Diagnostic Aid.

Note: Do not use the garage door opener (GDO) with any garage door opener that does not have the stop and reverse safety feature. This includes any garage door opener model manufactured before April 1, 1982.

Keyless Entry System Description and Operation

Keyless Entry System Description and Operation – Active

The keyless entry system is a vehicle entry device. The keyless entry system is used in conjunction with the door locks to unlock the vehicle. Keyless entry will lock/ unlock a door or open the rear compartment lid when a corresponding button on the keyless entry transmitter is pressed. This is accomplished by the transmitter sending a radio frequency to the remote control door lock receiver that has a direct link to the body control module (BCM). The BCM interprets the signal and activates the requested function or requests the appropriate ECU to activate the function via a serial data message. A low transmitter battery or radio frequency interference from aftermarket devices, such as 2-way radios, power inverters, computers, etc., may cause a system malfunction. High radio frequency traffic areas, such as gas stations that use pay-at-the-pump radio frequency transponders, may also cause interference that could lead to a malfunction. Keyless entry allows you to operate the following features:

- Door lock/unlock
- Rear compartment lid release
- Illuminated entry lamps
- Panic alarm/vehicle locator
- Remote vehicle start
- Passive keyless entry able/disable
- Automatic window express down, if equipped
- Automatic window express up, if equipped
- Automatic power mirror folding/unfolding, if equipped

Keyless Entry System Description and Operation – Passive

Passive keyless entry allows entry to a locked vehicle without pressing any buttons on the keyless entry transmitter. The passive entry system uses low frequency antennas in several different areas on the vehicle to determine the location of the transmitter. When passively opening a locked door or the rear compartment, you must have a programmed transmitter with you in your pocket, purse, or briefcase within a one meter range.

When an exterior door handle button is pressed or the rear compartment touch pad is pressed, the body control module activates the low frequency antenna which sends out a challenge to the keyless entry transmitter. Because of the low frequency, communication range is limited. The antenna will emit the challenge in a one meter range. The transmitter must be within this range to receive the challenge. The transmitter receives this challenge and emits it's response as an RF message, which is received by the remote control door lock receiver. If the response is correct, entry into the vehicle will be allowed.

As a customer convenience feature, the keyless entry system will notify the driver if the transmitter has been left in the vehicle after exiting by chirping the vehicle horn three times and displaying a message on the DIC. This may be turned off using vehicle personalization. Also, if the transmitter is left in the vehicle after the central door lock switch has been used to lock the vehicle, the driver door will remain unlocked after exiting the vehicle. This is intended to prevent locking the transmitter in the vehicle and being unable to access it.

Keyless Entry System Description and Operation – Keyless Start

The keyless start portion of the keyless entry system allows vehicle starting, having only the transmitter as your key. The keyless start system uses low frequency antennas in three different locations on the vehicle to determine the location of the transmitter. Multiple antenna are used to ensure complete coverage of the vehicle interior and rear compartment. When using the keyless start system, a programmed transmitter must be in the vehicle's interior, in the driver's pocket, purse, or briefcase.

When the ignition mode switch is pressed, the low frequency antennas emit a challenge to the keyless entry transmitter. The transmitter receives this challenge and emits it's response as an RF message, which is received by the remote control door lock receiver. If the response is correct, vehicle starting will be allowed. If RF communication is interrupted, a “No Remote Detected” message will be displayed on the DIC. In these cases, the transmitter can be placed in the transmitter pocket located in the center console. The immobilizer antenna coil is located directly beneath the transmitter pocket. Placing the transmitter in the pocket will create a low powered coupling between the transmitter and immobilizer antenna, allowing communications to occur and enabling vehicle starting. If the key has been idle the DIC may display “Key In Sleep Mode, Move Key, Then Start”. In this case move the vehicle key to start the vehicle.

The keyless entry system has the following components:

- Keyless entry integrated key/transmitter
- Driver and passenger side antennas
- Driver and passenger door handle switches (part of the door handle assembly)
- Rear fascia antenna
- Immobilizer antenna coil (front console antenna function)
- Rear console antenna
- Rear Compartment Antenna (If Equipped)
- Body control module (BCM)
- Remote control door lock receiver

Keyless Entry Transmitters

By operating any of the exterior door handle buttons or the start/stop switch, a nearby transmitter is challenged by a keyless entry antenna. The transmitter will send an RF response to the remote control door lock receiver, which communicates with the BCM. The BCM will interpret this communication and either allow or deny vehicle entry or starting.

Side Antennas

The keyless entry side antennas are used to transmit low frequency communications to the keyless entry transmitters.

The keyless entry side antennas are located in the driver and passenger body sides. The antennas are controlled by the body control module. When the exterior door handle button is pressed, the respective antenna will send out a challenge to the keyless entry transmitter, which begins the passive entry communications.

Rear Fascia Antenna

The rear fascia antenna is used to transmit low frequency communication to the keyless entry transmitters for entry to rear compartment.

The rear fascia antenna is located behind the rear fascia. The antenna is controlled by the body control module. When the rear compartment touch pad is pressed, the antenna sends out a challenge to the keyless entry transmitter, which begins the passive entry communications.

Immobilizer Coil Antenna

This antenna is located in the front of the center console.

The Immobilizer antenna coil is used for vehicle starting functions and for learning vehicle keys. When the ignition mode switch is pressed, the antenna is energized or "pinged". This emits a low frequency challenge signal that is received by the keyless entry transmitter. The transmitter will then reply to this challenge with a response and, if correct, vehicle starting will occur. If the transmitter battery is dead, weak, or the RF signal is being interrupted, the transmitter may be placed in the pocket to create a low powered coupling between the transmitter and immobilizer coil antenna, allowing communications to occur and enabling vehicle starting.

Rear Console Antenna

This antenna is located in the rear of the center console.

The rear console antenna is used for vehicle starting functions. When the ignition mode switch is pressed, the antenna is energized or "pinged". This emits a low frequency challenge signal that is received by the keyless entry transmitter. The transmitter will then reply to this challenge with a response and, if correct, vehicle starting will occur.

Rear Compartment Antenna (If Equipped)

This antenna is located near the center of the rear compartment area.

The rear compartment antenna is used for vehicle starting functions. When the ignition mode switch is pressed, the antenna is energized or "pinged". This emits a low frequency challenge signal that is received by the keyless entry transmitter. The transmitter will then reply to this challenge with a response and, if correct, vehicle starting will occur.

OnStar® Remote Link

A vehicle operator may have the ability to perform some of the keyless entry functions using applications on personal devices such as smart phones. Refer to OnStar Description and Operation 5-17.

Body Control Module (BCM)

The BCM is a multi-function module that performs the following functions:

- Receive and authenticate active transmitter and keyless start/entry signals from the remote control door lock receiver
- Determines the function requested by the transmitter signal
- Performs the function requested by the transmitter signal
- Activating vehicle antennas for passive keyless entry functions
- Activating vehicle antennas for keyless start functions
- Backup control for the ECM accessory wakeup and the run/crank relay
- If equipped, controls the electronic steering column lock
- Receiver of the exterior door handle switch inputs and door open switch (not the door ajar switch)
- Ignition mode switch monitoring

Unlock Driver Door Only – Active

Momentarily press the transmitter UNLOCK button in order to perform the following functions:

- Unlock only the driver door or all doors, if enabled through personalization
- Illuminate the interior lamps for a determined length of time, or until the ignition is turned ON
- Flash the exterior lights, if enabled through personalization
- Disarm the Content Theft Deterrent (CTD) system
- Deactivate the CTD system when in the alarm mode

Unlock All Doors – Second Operation – Active

Momentarily press the transmitter UNLOCK button a second time, within 5 seconds of the first press, to perform the following function:

Unlock the remaining doors

Unlock Driver Door Only – Passive

If enabled through personalization, approach the driver door with a valid keyless entry transmitter and press the door handle button to perform the following functions:

- Unlock and open only the driver door
- Disarm the CTD system, if equipped
- Deactivate the CTD system when in the alarm mode

Unlock All Doors – Passive

Approach any non driver door (front or rear) or, if enabled through personalization, the driver door with a valid keyless entry transmitter and press the door handle button to perform the following functions:

- Unlock all vehicle doors
- Disarm the CTD system, if equipped
- Deactivate the CTD system when in the alarm mode

Lock All Doors – Active

Press the transmitter LOCK button to perform the following functions:

- Lock all vehicle doors
- Immediately turn off the interior lamps
- Flash the exterior lights, if enabled through personalization
- Chirp the horn, if enabled through personalization
- Arm the CTD system

Lock All Doors – Passive

Exit the vehicle (with ignition off) with the keyless entry transmitter to automatically perform the following functions, if equipped.

- Lock all vehicle doors after a delay
- Flash the exterior lights, if enabled through personalization
- Chirp horn, if enabled through personalization
- Arm the CTD system

When all doors are closed, they can also be locked from the exterior by operating a front door handle button or touch pad while having a valid transmitter within range. Vehicles equipped with a rear door button can also lock all doors from the rear doors.

Rear Compartment Lid Release – Active (If Equipped)

If the vehicle transaxle is in PARK or NEUTRAL, a double press of the transmitter rear compartment release button will open the rear compartment lid.

Rear Compartment Lid Release – Passive (If Equipped)

Approach the rear of a locked vehicle with a valid keyless entry transmitter. Press the rear compartment lid release touch pad. The rear compartment lid will open.

Tailgate Release – Passive (If Equipped)

Approach the rear of a locked vehicle with a valid keyless entry transmitter. Press the tailgate release touch pad. The rear tailgate will open.

Vehicle Locator/Panic Alarm/Active

A single press of the panic button performs the following functions. Some functions may be dependent on personalization settings:

- Pulses the horn three times
- Flashes the exterior lamps three times

A press and hold of the panic button performs the following functions:

- Pulses the horn and flashes the parking lamps for 30 second or until the following conditions occur:
    - The panic button is pressed
    - The ignition switch is turned to the RUN position with a valid key

Remote Vehicle Start/Active (If Equipped)

The remote vehicle start function allows engine starting while not in the vehicle. It also allows the vehicle HVAC system and other vehicle systems to enable, providing a comfortable vehicle upon entry. The remote vehicle start sequence begins by pressing and releasing the remote vehicle start button on the keyless entry transmitter twice. The turn signal lamps will illuminate to indicate the vehicle has received the remote start request. Each time a remote vehicle start is performed, the vehicle doors are locked, however they may then be unlocked/locked with the transmitter at any time. Once activated, the engine is allowed to run for 15 minutes. The remote start operation can be repeated as many times as desired up to a total run time of 30 minutes. The remote vehicle start event may be cancelled at any time by pressing only the remote vehicle start button on the transmitter or by entering the vehicle and turning ON the hazard lamps.

Hood Ajar Switch/Active

The hood switch provides status of the hood to the BCM for remote vehicle start purposes. The switch is integrated into the hood latch assembly. The hood ajar switch provides 2 separate inputs to the BCM. These separate inputs allow the BCM to actively monitor for a hood ajar switch fault.

Remote Vehicle Start Circuit Description/ Active

The BCM receives a signal from the keyless entry transmitter indicating a remote vehicle start request. The BCM and ECM use the following inputs to verify the system is ready to enable a remote vehicle start event:

- Vehicle is not in valet mode
- Vehicle is in park
- Keyless entry transmitter is not in the vehicle
- The hood is closed
- The hazard switch is OFF
- Vehicle power mode is OFF
- The malfunction indicator lamp (MIL) is not commanded ON by the ECM
- Remote start timer does not equal 0 (the 30 minute maximum time has not been used)

When the BCM determines all conditions meet those required for a remote vehicle start event, a message is sent via serial data to the ECM. While the ECM is in remote vehicle start mode it will cut fuel to the engine if any of the following monitored conditions occur:

- Vehicle speed is greater than 0
- Transmission is not in P
- Excessive engine coolant temperature
- Low oil pressure
- Engine crank time is greater than 30 seconds
- Excessive engine speed
- Accelerator pedal position too high
- Immobilizer system indicates a theft attempt

If any conditions prevent a remote start or cause a remote start operation to be cancelled there is a record of the cause in the scan tool.

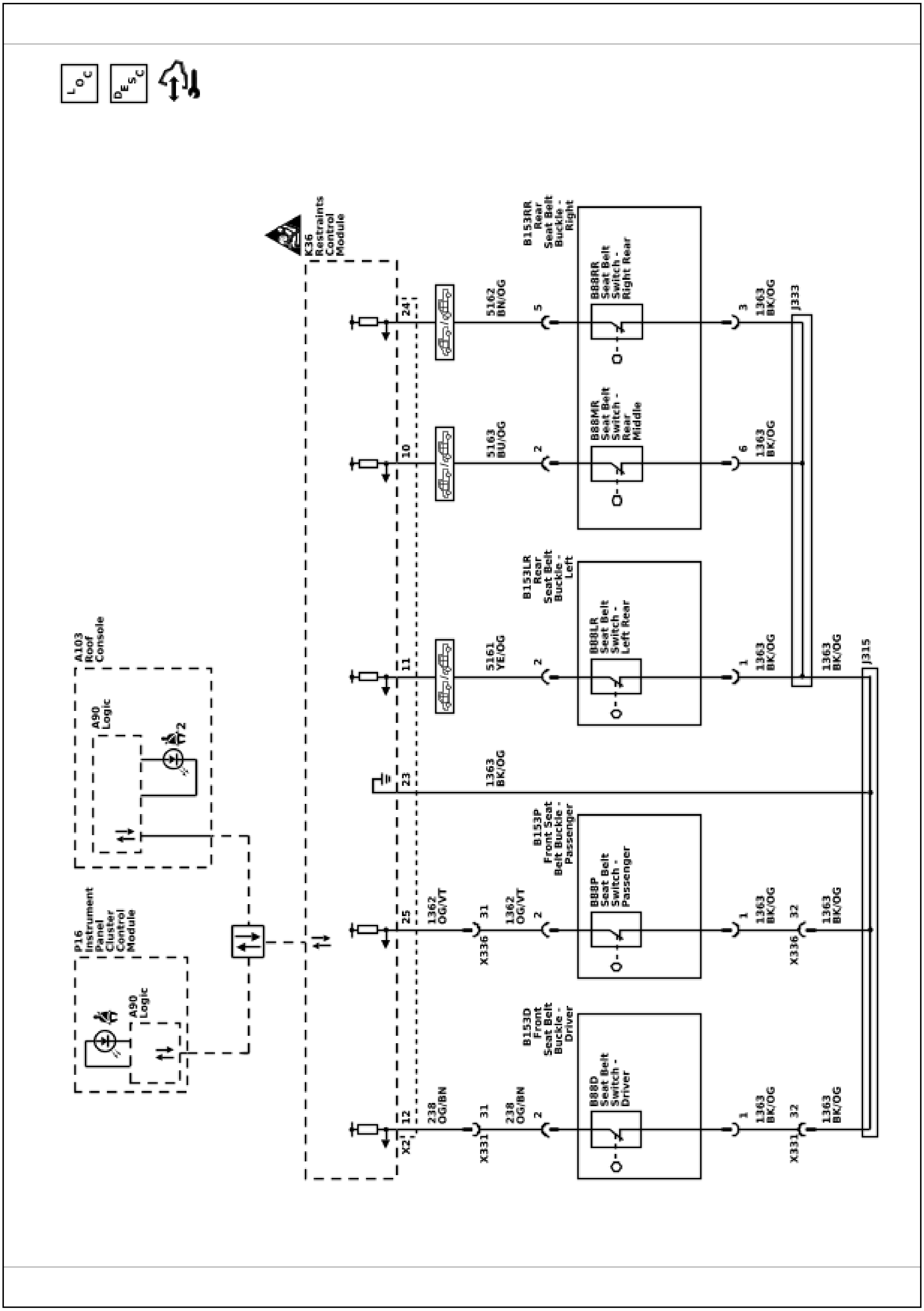
Keyless Entry Personalization

Vehicle lock/unlock functions and remote vehicle start settings may be personalized for the vehicle. This includes the capability of turning the passive entry system completely off. For functional descriptions and programming instructions, refer to the vehicle owners manual.

Seat Belts

Schematic and Routing Diagrams

Seat Belt Schematics (Seat Belts)


LOC
DESC
P16 Instrument Panel Cluster Control Module
A90 Logic
A103 Roof Console
A90 Logic
2
K36 Restraints Control Module
X2
12
25
23
11
10
24
238 OG/BN
1362 OG/VT
1363 BK/OG
5161 YE/OG
5163 BU/OG
5162 BN/OG
X331
X336
31
2
5
B153D Front Seat Belt Buckle - Driver
B153P Front Seat Belt Buckle - Passenger
B153LR Rear Seat Belt Buckle - Left
B153RR Rear Seat Belt Buckle - Right
B88D Seat Belt Switch - Driver
B88P Seat Belt Switch - Passenger
B88LR Seat Belt Switch - Left Rear
B88MR Seat Belt Switch - Rear Middle
B88RR Seat Belt Switch - Right Rear
1
6
3
32
J315
J333

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Description and Operation

Seat Belt System Description and Operation

Restraint System

The primary means of occupant restraint are the front and rear seat belts. Seat belts help to keep the occupants inside the passenger compartment and gradually reduce the impact forces during the following events:

- Frontal impact
- Rear impact
- Side impact
- Rollover event

All seat belt retractors have emergency locks. The retractors remain unlocked during normal operation and under normal driving conditions to allow free movement of the upper body of each occupant. The seat belt webbing is locked into position by a pendulum, which causes a locking bar to engage a cog on the spool of the retractor mechanism, when the following conditions occur:

- Rapid extraction of the seat belt webbing from the retractor
- Abrupt change in vehicle velocity
- Operation of the vehicle on a steep slope

The seat belts have an automatic locking (cinch) feature. The cinch feature is activated when the seat belt webbing is completely extended from the retractor. It prevents the webbing from extending beyond the position at which it can retract. Use of the cinch feature is recommended for securing a child seat. The cinch feature may be cancelled by allowing the webbing to wind back completely into the retractor. After the cinch feature is cancelled, the webbing is unlocked. This vehicle is also equipped with a Supplemental Inflatable Restraint (SIR) system. Refer to *Supplemental Inflatable Restraint System Description and Operation 10-55*.

Motorized Seat Belts

A motorized seat belt is a seat belt with a motor coupled to the shoulder belt retractor. The motor performs a reversible, pretightening action (retraction) to reduce the slack in the seat belt. The motorized seat belt provides the driver and passenger a sense of safety and, in the case of severe braking or a crash, more quickly couples the occupant to the vehicle, enhancing the safety to the occupant.

Motorized seat belts monitor vehicle information to determine when to perform each of the following retractions

- Full retraction for such situations but not limited to: panic braking and or skidding
- Dynamic support for lateral and longitudinal dynamics
- Slack removal when the vehicle speed above enable speed

Preconditions for motorized seat belt retractions

- Seat belt buckle is latched
- Vehicle speed greater than or equal to 25 kph (16 mph)
- All messages on serial data are received as valid

Triggers that may cause motorized seat belt retractions

- Emergency Braking
- Sudden Emergency / Panic Braking
- High Vehicle Deceleration Detection
- Ice Braking Detection
- Oversteer and Understeer

Motorized seat belt inputs

- Vehicle Power Mode
- Transmission Gear
- Wheel Speeds
- Vehicle Acceleration
- Accelerator Pedal Position
- Steering Wheel Angle and Gradient
- Yaw Rate and Lat/Long Acceleration
- Brake Pedal Position, Gradient, Pressure, Initial Travel
- Vehicle Stability

Motorized seat belt output signals

- Driver information center message – motorized seat belt Failed “Service Automatic Seatbelt Tightening”
- Driver information center message – motorized seat belt Unavailable “Automatic Seatbelt Tightening Unavailable”

Motorized seat belt retractions are inhibited when seat belt unbuckled.

Driver and passenger motorized seat belts operate independently.

Front Seat Belt System

The front seat belt system includes the driver and passenger seat belts, seat belt reminder indicators, retractors, and anchor pretensioners. They are all part of the SIR system, refer to *Supplemental Inflatable Restraint System Description and Operation 10-55* . The driver seat belt reminder indicator is controlled by a switch in the driver seat belt buckle. The passenger seat belt reminder indicator is controlled by a switch in the passenger seat belt buckle and the Restraint Occupant Classification System Module. For more on the Restraint Occupant Classification System Module, refer to *Supplemental Inflatable Restraint System Description and Operation 10-55*. When the vehicle is on, the seat belt reminder indicator and tone alarm will operate in the following cases:

- The driver seat belt is unbuckled.
- The passenger seat belt is unbuckled while the seat is occupied.

Rear Seat Belt System

The rear seat belt system includes the following components:

- The rear seat belt retractor located at the wheelhouse panel and attached to the floor panel.
- The rear seat belt buckles and the center seat belt buckle attached to the seat.

Child Seat Restraint System

Warning: A child in a rear-facing child restraint can be seriously injured if the front passenger air bag inflates, because the back of a rear-facing child restraint would be very close to the inflating air bag. NEVER use a rear-facing child restraint in this vehicle. If a forward-facing child restraint is suitable for your child, ALWAYS move the front passenger seat as far back as it will go and then install the child restraint. Be sure the child restraint position does not conflict with any additional requirements provided by the manufacturer. For more information, refer to the vehicle owner's manual and the instructions that came with the child restraint.

All vehicles are equipped with a dual-mode type retractor with emergency and automatic locking features. The automatic locking feature is for the restraint of a child seat. The child seat can be secured by pulling the seat belt all the way out to lock it, then tightening the seat belt around the child seat. If the child seat has a top strap, the child seat should be anchored. This applies to the seats designed with the top strap provision and for the vehicles sold in Canada. To ensure the correct top strap angle, the child seat is only to be used at the seating position for which the top strap anchor is installed. The child seat should be installed and secured according to the manufacturer's directions.

Seat Belt Reminder Indicators

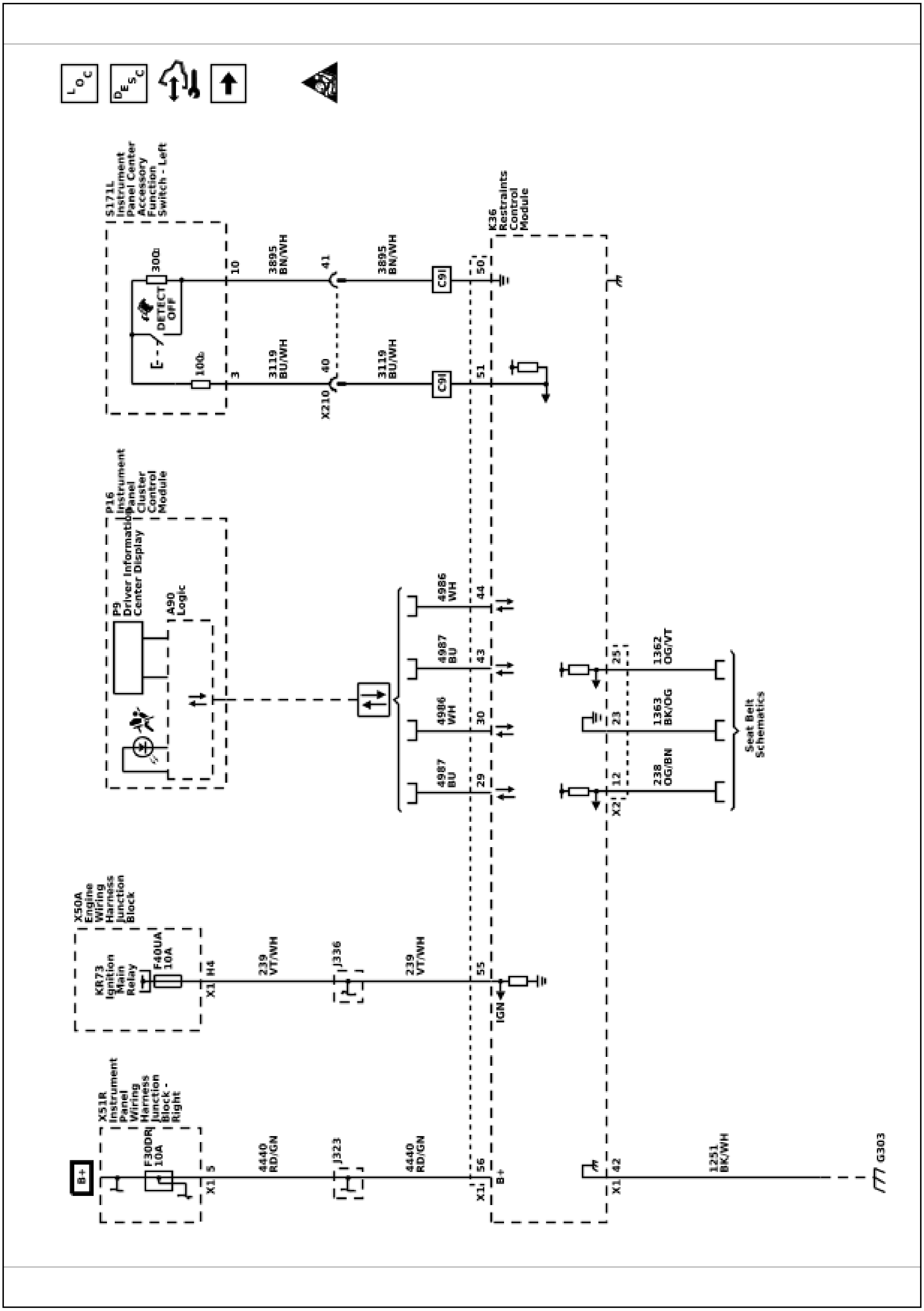
There is a driver seat belt reminder indicator located on the instrument cluster and a passenger seat belt reminder located on the overhead console. There also may have a rear seat belt reminder located in the instrument cluster. The state of the seat belt reminder indicators is determined by the Restraints Control Module. The seat belt reminder indicator illuminates under the following conditions:

- The Restraints Control Module sends the status of the driver seat belt to the instrument cluster via serial data. The passenger seat belt status is sent to the driver information center via serial data. The rear seat belt status is sent to the driver information center via serial data. If any of the seat belts are unfastened, the instrument cluster will send a message requesting a chime sound to be turned ON after a system check.

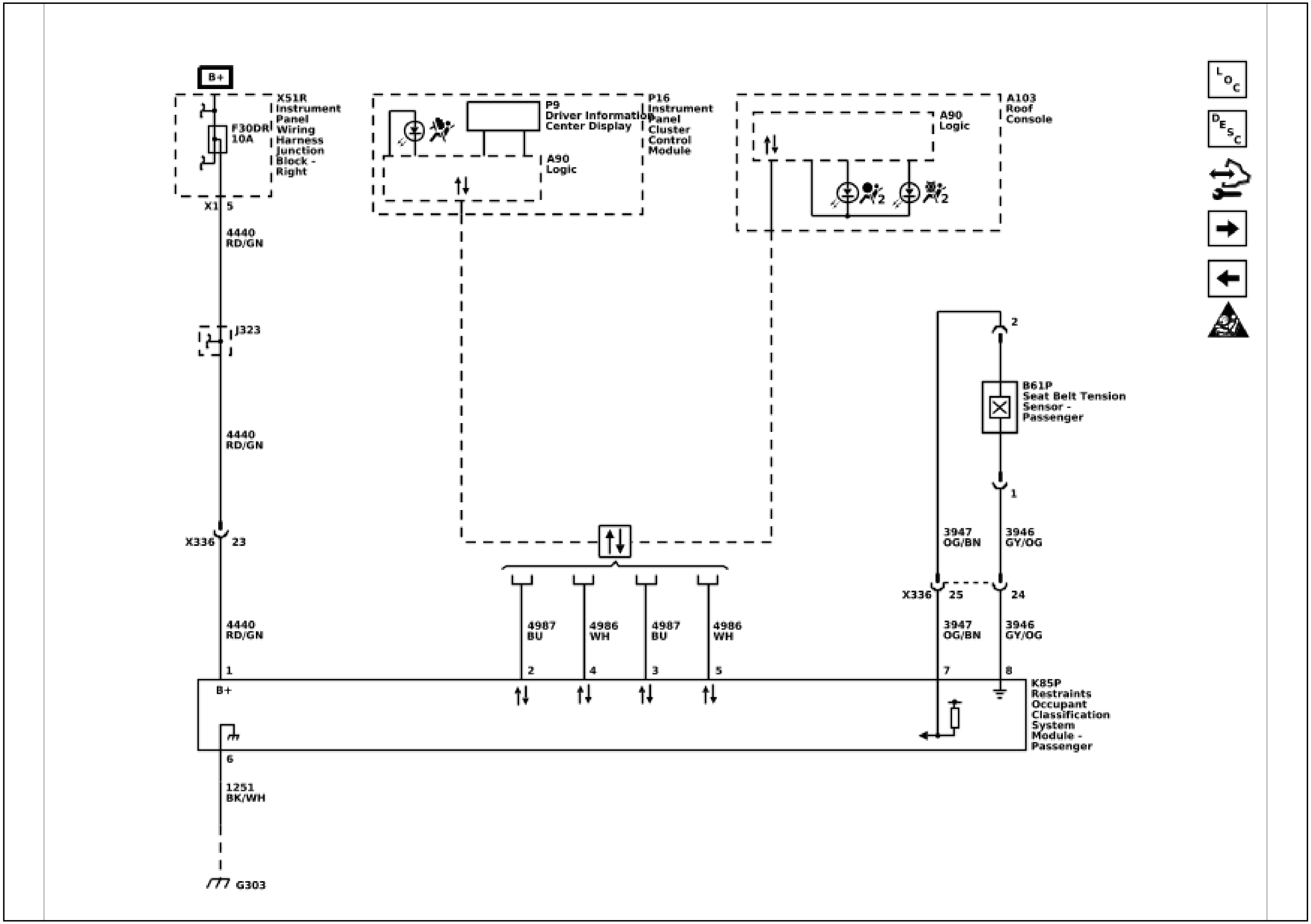
Supplemental Restraints

Schematic and Routing Diagrams

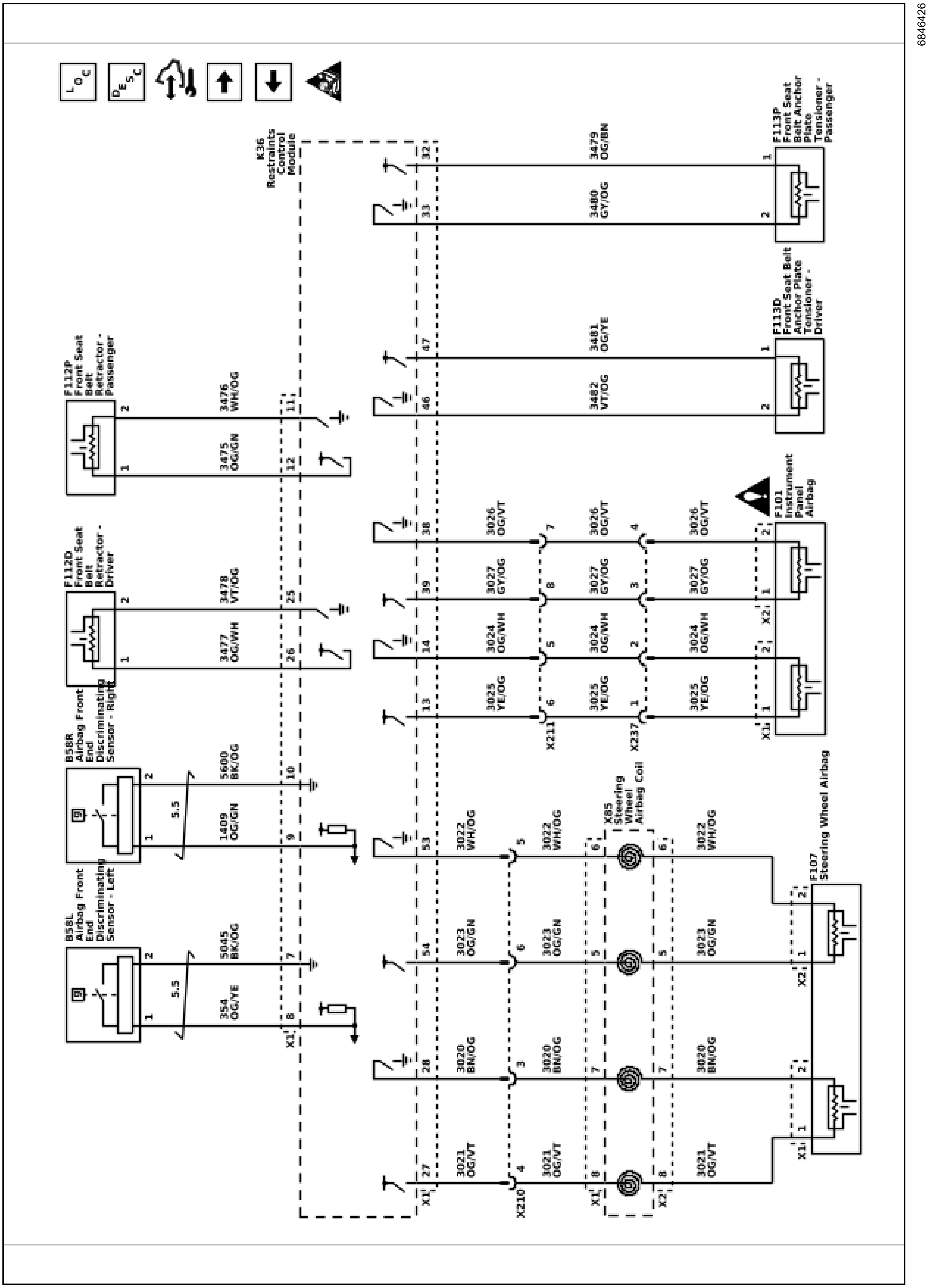
SIR Schematics (Module Power, Ground, Serial Data, Controls, Indicators, and Subsystem References)


6846424
S171L Instrument Panel Center Accessory Function Switch - Left
DETECT OFF
300Ω
100Ω
10
3
3895 BN/WH
3119 BU/WH
41
40
X210
C91
50
51
K36 Restraints Control Module
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
4986 WH
4987 BU
44
43
30
29
1362 OG/VT
1363 BK/OG
238 OG/BN
25
23
12
X2
Seat Belt Schematics
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F40UA 10A
X1 H4
239 VT/WH
J336
55
IGN
X51R Instrument Panel Wiring Harness Junction Block - Right
B+
F30DR 10A
X1 5
4440 RD/GN
J323
X1 56
1251 BK/WH
X1 42
G303

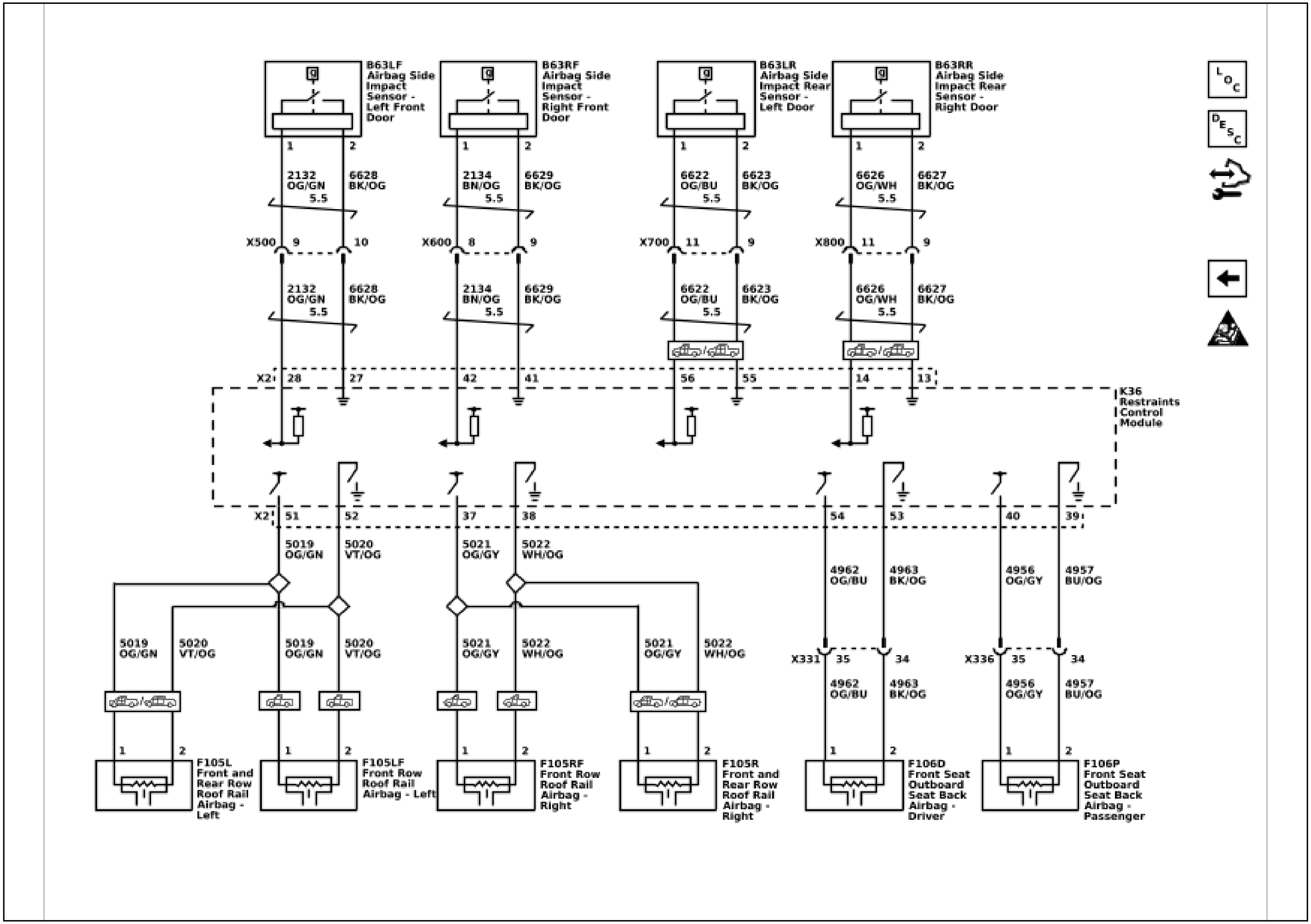
SIR Schematics (Passenger Presence Module)


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F30DR 10A
X1 5
4440 RD/GN
J323
4440 RD/GN
X336 23
4440 RD/GN
1
B+
6
1251 BK/WH
G303
P9 Driver Information Center Display
P16 Instrument Panel Cluster Control Module
A90 Logic
A103 Roof Console
A90 Logic
2
2
4987 BU
4986 WH
4987 BU
4986 WH
2
4
3
5
B61P Seat Belt Tension Sensor - Passenger
2
1
3947 OG/BN
3946 GY/OG
X336 25
24
3947 OG/BN
3946 GY/OG
7
8
K85P Restraints Occupant Classification System Module - Passenger
LOC
DESC
6846425

SIR Schematics (Frontal Impact Sensing and Deployment)


6846426
LOC
DESC
K36 Restraints Control Module
F113P Front Seat Belt Anchor Plate Tensioner - Passenger
F113D Front Seat Belt Anchor Plate Tensioner - Driver
F112P Front Seat Belt Retractor - Passenger
F112D Front Seat Belt Retractor - Driver
B58R Airbag Front End Discriminating Sensor - Right
B58L Airbag Front End Discriminating Sensor - Left
F101 Instrument Panel Airbag
X85 Steering Wheel Airbag Coil
F107 Steering Wheel Airbag
3479 OG/BN
3480 GY/OG
3481 OG/YE
3482 VT/OG
3476 WH/OG
3475 OG/GN
3478 VT/OG
3477 OG/WH
3026 OG/VT
3027 GY/OG
3024 OG/WH
3025 YE/OG
5600 BK/OG
1409 OG/GN
5045 BK/OG
354 OG/YE
3022 WH/OG
3023 OG/GN
3020 BN/OG
3021 OG/VT
5.5
X1
X2
X210
X211
X237
32
33
47
46
38
39
14
13
53
54
28
27
11
12
25
26
10
9
7
8
1
2
3
4
5
6

SIR Schematics (Side Impact Sensing and Deployment)


B63LF Airbag Side Impact Sensor - Left Front Door
B63RF Airbag Side Impact Sensor - Right Front Door
B63LR Airbag Side Impact Rear Sensor - Left Door
B63RR Airbag Side Impact Rear Sensor - Right Door
1
2
2132 OG/GN 5.5
6628 BK/OG
2134 BN/OG 5.5
6629 BK/OG
6622 OG/BU 5.5
6623 BK/OG
6626 OG/WH 5.5
6627 BK/OG
X500 9 10
X600 8 9
X700 11 9
X800 11 9
X2 28 27
42 41
56 55
14 13
K36 Restraints Control Module
X2 51 52
37 38
54 53
40 39
5019 OG/GN
5020 VT/OG
5021 OG/GY
5022 WH/OG
4962 OG/BU
4963 BK/OG
4956 OG/GY
4957 BU/OG
X331 35 34
X336 35 34
F105L Front and Rear Row Roof Rail Airbag - Left
F105LF Front Row Roof Rail Airbag - Left
F105RF Front Row Roof Rail Airbag - Right
F105R Front and Rear Row Roof Rail Airbag - Right
F106D Front Seat Outboard Seat Back Airbag - Driver
F106P Front Seat Outboard Seat Back Airbag - Passenger
L O C
D E S C
6846427

Description and Operation

Supplemental Inflatable Restraint System Description and Operation

The supplemental inflatable restraint (SIR) system, comprised of the Restraints Control module (RCM), impact sensors, Airbags, Restraint Occupant Classification System Module, and seat belt Pretensioners, supplements the protection offered by the seat belts. The RCM determines the severity of a collision using data collected from impact sensors located at strategic points on the vehicle. The RCM processes the information provided by the sensors to provide the safest combination of Airbag and pretensioner deployment. The RCM will deploy the Airbags and Pretensioners if it detects a collision of sufficient force. If the force of the impact is not sufficient to warrant Airbag deployment, the RCM may still deploy the seat belt Pretensioners. The RCM contains a sensing device that translates vehicle acceleration to an electrical signal. The RCM compares these signals to the threshold values stored in memory. If the signals exceed the stored threshold value, the RCM will determine the severity of the event and may deploy restraints. The RCM continuously monitors the deployment loops and electrical components for malfunctions. Upon detection of a circuit malfunction, the RCM will set a DTC and illuminate the SIR system Airbag indicator.

Note: The SIR System may be active up to 30 seconds after the ignition transitions to OFF.

The supplemental inflatable restraint system utilizes the following components:

- Restraints Control Module
- Airbag Indicator
- Airbags
- Seat Belt Pretensioners
- Impact Sensors
- Restraints Occupant Classification System Module (AL0)
- Passenger Airbag Indicator (C99 / AL0)
- Passenger Airbag Disable Switch (C99)
- Seat Belt Tension Sensor
- Seat Belt Indicators
- Event Data Recorder (EDR) Data
- Non-locked event storage overwrite mechanism and over writable event types

Restraints Control Module

The RCM is the control unit for the SIR system. The RCM contains internal sensors in addition to the external impact sensors. The RCM contains sensors which translate vehicle acceleration into an electrical signal, which may be used by other modules. In the event of a collision, the RCM compares the signals from the internal and external impact sensors to a threshold value stored in memory. When the generated signals exceed the stored value, the RCM will cause current to flow through the appropriate deployment loops to deploy the restraints. The RCM records the SIR system status when a deployment occurs and illuminates the SIR system Airbag indicator. The RCM performs continuous diagnostic monitoring of the SIR system electrical components and circuitry when the ignition is ON. If the RCM detects a malfunction, a DTC will set and the RCM will command the instrument cluster to illuminate the SIR system Airbag indicator, notifying the driver that a malfunction exists. If power is lost during a collision, the RCM maintains a limited energy reserve for deployment of the Airbags. It is important when disabling the SIR system for servicing or rescue operations to allow the limited energy reserve to dissipate, which could take up to 2 minutes.

Airbag Indicator

The SIR system Airbag indicator, located in the instrument cluster, is used to notify the driver of SIR system malfunctions and verify that the RCM is communicating with the instrument cluster. When the ignition is turned ON, the RCM is active. The instrument cluster will momentarily turn on the SIR system Airbag indicator. While the indicator is on, the RCM conducts tests on all SIR system components and circuits. If no malfunctions are detected the RCM will communicate with the instrument cluster through the serial data circuit and command the SIR system Airbag indicator to turn OFF. The RCM provides continuous monitoring of the SIR system components and circuits by conducting a sequence of checks. If a malfunction is detected the RCM will set a DTC and command the instrument cluster to illuminate the SIR system Airbag indicator via serial data. The presence of an SIR system malfunction could result in non-deployment of the inflatable restraints or deployment in conditions that normally would not warrant deployment. The SIR system Airbag indicator will remain on for the duration of the malfunction or until the system has been repaired.

Airbags

The vehicle will contain a number of Airbags, depending on vehicle available and optional equipment:

- Steering wheel
- Instrument panel
- Driver seat
- Passenger seat
- Instrument Panel Lower Airbag
- Passenger knee
- Left roof rail
- Right roof rail

To view the locations of the Airbags refer to: *Master Electrical Component List 8-855*.

Airbags contain a housing, inflatable Airbag, an initiating device, a canister of gas generating material and, in some cases, stored compressed gas. Each Airbag has a discrete deployment loop to supply current and deploy the Airbag. The current passing through the Airbags ignite the material in the canister producing a rapid generation of gas and is some cases, the release of compressed gas. The gas produced from this reaction rapidly inflates the Airbag. Once the Airbag is inflated, it deflates through the Airbag vent holes and/or the bag fabric.

The steering wheel and instrument panel Airbag will either be a dual-stage or a single stage design. A dual-stage Airbag uses two stages of deployment, which varies the amount of restraint to the occupant according to the collision severity. For moderate frontal collisions, the Airbag deploys at less than full deployment which consists of stage 1 of the Airbag. During a more severe frontal collision, a full deployment is initiated which consists of stage 1 and stage 2 of the Airbag.

Seat Belt Pretensioners
The vehicle will contain a number of seat belt Pretensioners, depending on vehicle available and optional equipment:

- Driver – Seat belt anchor
- Driver – Seat belt retractor
- Passenger – Seat belt anchor
- Passenger – Seat belt retractor
- Rear Outboard Left/Right Passenger – Seat belt retractor

To view the locations of the Airbags refer to: *Master Electrical Component List 8-855*.

The seat belt Pretensioners consist of a housing, seat belt retractor, seat belt anchor, seat belt webbing, initiator, and a canister of gas generating materials. The initiator is part of the seat belt pretensioner deployment loop. When the vehicle is involved in a collision of sufficient force, the RCM causes current to flow through the seat belt deployment loops to the initiator. Current passing through the initiator ignites the material in the canister producing a rapid generation of gas. The gas produced from this reaction deploys the seat belt Pretensioners which removes the slack in the seat belts. Depending on the severity of the collision, the seat belt Pretensioners may deploy without the frontal inflator modules deploying, or they will deploy immediately before the frontal inflator modules deploy.

Impact Sensors
The vehicle will contain a number of impact sensors, depending on vehicle available and optional equipment:

- Front Impact Sensor — Left
- Front Impact Sensor — Right
- Side Impact Sensor — Left Front
- Side Impact Sensor — Right Front
- Side Impact Sensor — Left Middle
- Side Impact Sensor — Right Middle
- Side Impact Sensor — Left Rear
- Side Impact Sensor — Right Rear

To view the locations of the Airbags refer to: *Master Electrical Component List 8-855*.

The impact sensors contain a sensing device which monitors vehicle acceleration or pressure to detect collisions that are severe enough to warrant Airbag deployment. The impact sensors are not part of the deployment loop, but instead provide input to the RCM.

Restraints Occupant Classification System Module
The Restraints Occupant Classification System Module is used to monitor the type of occupant that is sitting in the front passenger seat and communicate the status to the RCM. The RCM then uses this information to determine whether to enable or suppress the deployment of the passenger instrument panel Airbag. The Restraints Occupant Classification System Module consists of an electronic control module, a sensor mat in the seat, Seat Belt Tension Sensor (if equipped), and a harness.

Passenger Airbag Indicator
The passenger Airbag indicator identifies the status of the instrument panel Airbag. The RCM will momentarily turn on the passenger Airbag indicators after ignition is turned ON. If an occupant is not detected in the passenger seat or the occupant type is not suitable for Airbag deployment, the Restraints Control module will illuminate the passenger Airbag OFF indicator. If an occupant is detected in the passenger seat, the Restraints Control module will illuminate the passenger Airbag ON indicator.

Seat Belt Tension Sensor
The seat belt tension sensor (if equipped) is mounted on the passenger seat belt retractor to measure the seat belt tension. If the shoulder portion of a passenger seat belt is fully extended, the infant car seat restraint locking feature may be engaged, disabling the passenger Airbag.

Passenger Airbag Disable Switch
The passenger Airbag disable switch provides the means to manually disable the ability for the passenger instrument panel Airbag to deploy. The vehicle has a

passenger Airbag status indicator to inform the driver when the passenger Airbag is on or off based on the disable switch position.

Seat Belt Indicators
The seat belt indicators are controlled by the RCM. For further information on seat belt indicators refer to: *Seat Belt System Description and Operation 10-48*.

Event Data Recorder (EDR) Data
The vehicle is equipped with an event data recorder (EDR). When a specific collision or similar condition occurs (such as airbag deployment or hitting a road obstacle), the recorder records the data related to vehicle dynamics and safety systems within a short period of time, such as the status of occupant safety components, status of accelerator/brake pedals, vehicle speed, etc., helping understand the operating conditions of vehicle systems.

The data elements recorded by EDR mainly include the following data:

No.	Data Element	Data Source	Collection Method
A1	Longitudinal delta V	EDR acceleration sensor in EDR controller	None
A2	Maximum recorded longitudinal delta V	EDR acceleration sensor in EDR controller	None
A3	Time to maximum recorded longitudinal delta V	EDR acceleration sensor in EDR controller	None
A4	Clipping flag	Since B1 lateral acceleration has been recorded, it is not necessary to record the clipping flag	None
A5	Vehicle velocity	Wheel speed sensor, transmitted via CAN bus after calculation	CAN bus
A6	Service brake, on or off	Brake pedal position sensor, transmitted via CAN bus after calculation	CAN bus
A7	Driver safety belt status	Driver seat belt buckle	Hard wire
A8	Accelerator pedal position, percentage of fully open position	Accelerator pedal position sensor, transmitted via CAN bus after calculation	CAN bus
A9	Revolution Per Minute (RPM)	Engine crankshaft position sensor, transmitted via CAN bus after calculation *Not required for electric vehicles	CAN bus *Not required for electric vehicles
A10	Power-on cycle at event	EDR controller	None
A11	Power-on cycle at reading	EDR controller	None
A12	Complete status of event data record	EDR controller	None
A13	Time interval from this event to the last event	EDR controller	None
A14	Vehicle Identification Number(VIN)	EDR controller	None
A15	ECU hardware number	EDR controller	None
A16	ECU serial number	EDR controller	None
A17	ECU software number	EDR controller	None
B1	Longitudinal acceleration	EDR acceleration sensor in EDR controller	None

No contents related to intelligent control are available now for Level A elements above.

The recorded vehicle speed data is obtained from the on-board CAN bus. They are obtained by a vehicle speed sensor connected to other modules on the vehicle (such as engine control or transmission control module or new energy control, etc.), and transmitted and released via CAN bus after calculation.

The above data can be extracted by purchased general on-board diagnostic tools that meet the requirements in SAE J1962 and ISO 15765 and their referenced standards.

Non-locked event storage overwrite mechanism and over writable event types

Locking Conditions:

- Deployment event of irreversible restraints will be permanently locked.

- Non-deployment events will be locked, but become non-locked events after 255 ignition cycles.

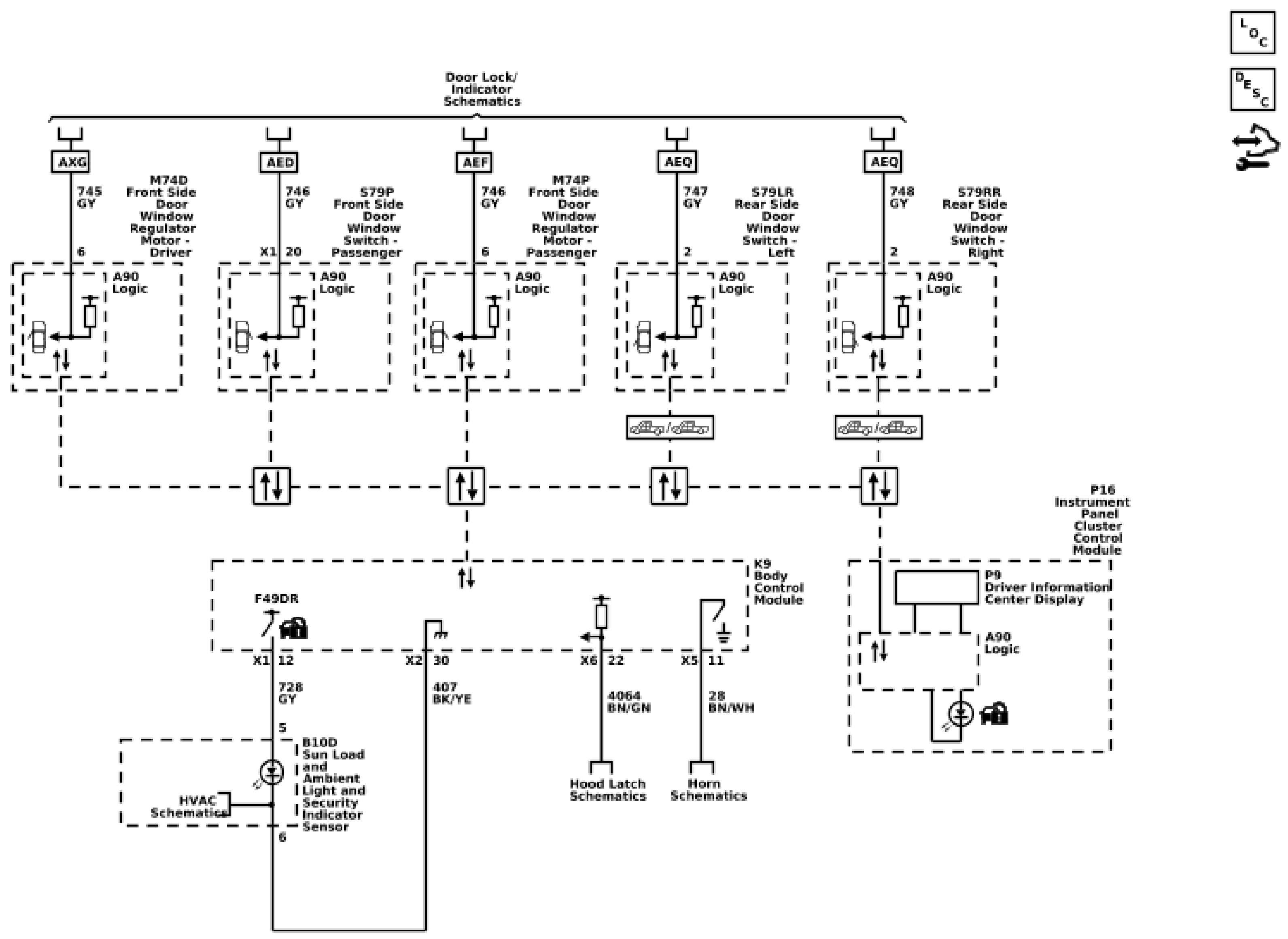
Overwrite Mechanism:

- Permanently locked events will not be overwritten. Only the non-locked EDR events can be overwritten, overwriting the earliest event first.
- If the EDR storage space is insufficient, the deployment events of irreversible restraints can overwrite any non-deployment events.
- If the EDR storage space is insuficcient, the non-deployment events can overwrite any non-deployment events that become non-locked after 255 ignition cycles.

Theft Deterrent

Schematic and Routing Diagrams

Theft Deterrent System Schematics (Theft Deterrent System)


Door Lock/ Indicator Schematics
AXG
745 GY
M74D Front Side Door Window Regulator Motor - Driver
6
A90 Logic
AED
746 GY
S79P Front Side Door Window Switch - Passenger
X1 20
A90 Logic
AEF
746 GY
M74P Front Side Door Window Regulator Motor - Passenger
6
A90 Logic
AEQ
747 GY
S79LR Rear Side Door Window Switch - Left
2
A90 Logic
AEQ
748 GY
S79RR Rear Side Door Window Switch - Right
2
A90 Logic
P16 Instrument Panel Cluster Control Module
P9 Driver Information Center Display
A90 Logic
K9 Body Control Module
F49DR
X1 12
728 GY
X2 30
407 BK/YE
X6 22
4064 BN/GN
X5 11
28 BN/WH
5
B10D Sun Load and Ambient Light and Security Indicator Sensor
6
HVAC Schematics
Hood Latch Schematics
Horn Schematics
6846428

Description and Operation

Theft Systems Description and Operation

When armed, the content theft deterrent system is designed to deter vehicle content theft by pulsing the horns and exterior lamps for approximately 30 seconds when an unauthorized vehicle entry is detected. However, the content theft deterrent system does not affect engine starting.

An unauthorized entry can be any of the following with the content theft deterrent system armed:

- Unauthorized entry into the engine area
- Unauthorized entry into the vehicle compartments
- When any door is opened without using the UNLOCK command from a keyless entry transmitter
- After a battery reconnect, if the battery was disconnected with the content theft deterrent system armed

The components of the content theft deterrent system are:

- Body Control Module (BCM)
- Remote control door lock receiver
- Security indicator
- Door ajar switches
- Hood ajar switch
- Liftgate ajar switch, if equipped
- Intrusion sensor, if equipped
- Intrusion sensor disable switch, if equipped
- Glass breakage sensor, if equipped
- Alarm siren, if equipped

Arming the Content Theft Deterrent System

Use the following procedure in order to arm the system:

1. Place the vehicle in P (park).
2. Ignition OFF/Vehicle OFF.
3. Open any door.

Note: The system is not armed if the doors are locked manually; the power door lock switch or remote keyless entry transmitter must be used to arm the content theft deterrent system.

4. Lock the doors with the power door lock switch or by pressing the LOCK button on the transmitter. The system is in standby mode and will not start the arming timer until all doors are closed.
5. The system will begin the arm sequence immediately after the last door is closed. If the keyless entry transmitter is used to arm the system after the vehicle doors are closed, the arm sequence will begin as soon as the LOCK command is received from the transmitter.
6. Pressing the LOCK button on the keyless entry transmitter a second time will bypass the delayed arming function and force the system to arm.

Locking the Vehicle Without Arming the Content Theft Deterrent System

Locking the vehicle may be accomplished without arming the content theft deterrent system. Use of the manual door locks will lock the vehicle, but will not arm the content theft deterrent system.

Disarming an Armed System/Silencing an Alarm

If system arming has been requested by the power door lock switch or the keyless entry transmitter, it must be disarmed.

Note: Disconnecting the battery or removing fuses does not disable the arm or alarm modes, since the BCM stores the content theft deterrent mode status in memory.

- To disarm the content theft deterrent system in standby mode, perform one of the following:
  - Press the UNLOCK button on the keyless entry transmitter.
  - Approach the vehicle with a valid keyless entry transmitter and pull the vehicle door handle.
  - Turn the ignition ON/Vehicle ON.
- To disarm the content theft deterrent system in the armed mode (non-event) or when activated (during an alarm event):
  - Press the UNLOCK button on the keyless entry transmitter.
  - Turn the ignition ON/Vehicle ON.

Content Theft Deterrent Circuit Description

The following is a description of each component used in the content theft deterrent system:

Body Control Module

The content theft deterrent system is an internal function of the BCM which utilizes serial data and various switch inputs information to perform content theft deterrent functions. When the BCM detects an unauthorized entry, it activates the horns and exterior lamps. The BCM has 4 basic modes (disarmed, standby, armed, and alarm) for operating the content theft deterrent system. The different modes are described below.

1. The BCM has the content theft deterrent system in a disarmed mode until the following conditions are detected:

- Ignition OFF/Vehicle OFF.
- Doors locked by either the power door lock switch or the LOCK button on the transmitter.

2. The BCM enters the standby mode when the above conditions are detected. If a door was already opened when the arm mode was requested, the standby mode does not start the timer until the last door is closed.
3. When the last door is closed, a 15 second timer is activated. Once the timer has expired, the BCM enters the armed mode. After this delay, any unauthorized entry will activate the alarm mode.
4. When the BCM detects an unauthorized entry, the BCM enters the alarm mode. The BCM activates the horns and exterior lamps for 30 seconds. This is followed by a three minute time-out with the horn no longer active. If no new intrusions are detected after the time-out, the horn is not active. The system must be disarmed or the intrusion condition removed after the time-out for the system to exit alarm mode.

Remote Control Door Lock Receiver
The keyless entry system can arm and disarm the content theft deterrent system. When the remote control door lock receiver receives a door lock or unlock signal from the transmitter, the remote control door lock receiver sends a message to the BCM via serial data to perform the appropriate arm/disarm functions.

Security Indicator
The security LED is illuminated on the upper I/P by the BCM. The content theft deterrent system uses the security LED to inform the driver of system status prior to arming.

Door Ajar Switches
The content theft deterrent system uses the door ajar switches as a status indicator to activate the alarm. The door ajar switches are monitored by the body control module via a discrete input from each door ajar switch. If the BCM receives a signal indicating a door is opened when the content theft deterrent system is armed, the BCM activates the alarm.

Hood Ajar Switch
The content theft deterrent system uses the hood ajar switch as a status indicator to activate the alarm. The BCM monitors the hood ajar switch via a discrete input from the switch. If the BCM receives a signal indicating the hood has been opened when the content theft deterrent system is armed, the BCM activates the alarm.

Liftgate Ajar Switch
The content theft deterrent system uses the liftgate ajar switch as a status indicator to activate the alarm. The BCM monitors the liftgate ajar switch via a discrete input from the switch. If the BCM receives a signal indicating the liftgate has been opened when content theft deterrent system is armed, the BCM activates the alarm.

Intrusion Sensor
The intrusion sensor is located in the overhead console and uses two ultrasonic sensors to detect any motion inside the vehicle. If motion is detected inside the vehicle while the content theft deterrent system is armed, the system will transition to the alarm mode. The intrusion sensor also acts as an inclination sensor. The inclination sensor determines the vehicles level when the content theft deterrent system is armed. If the vehicle level is changed while the system is armed, such as being lifted by a tow truck or raised with a jack, the alarm will be activated. The intrusion sensor can be disabled using the intrusion sensor disable switch. The intrusion sensor disable switch also shows the intrusion sensor status using a status LED.

Glass Breakage Sensor
The glass breakage sensors (if equipped) are located on the rear side windows and are supplied battery voltage at all times. The BCM monitors the glass breakage sensor signal circuit. If the rear side glass is broken, the glass breakage sensor signal circuit will open and the BCM will enter the alarm mode.

Alarm Siren
The content theft deterrent system uses the alarm siren as an audible alert device to alert individuals near the vehicle that a vehicle intrusion is occurring. The siren is supplied battery voltage and ground for operation and communicates with the body control module (BCM) via a dedicated LAN circuit.

Inputs
The BCM monitors the following inputs for content theft deterrent:

- Door ajar switches
- Keyless entry transmitter LOCK/UNLOCK buttons; a message from the remote control door lock receiver
- Immobilizer status—The BCM uses the immobilizer status for disarming the system or silencing an alarm when the correct vehicle key is used to start the vehicle
- Liftgate ajar switch
- Hood ajar switch
- Intrusion sensor
- Glass breakage sensor

Outputs

The BCM controls the following for content theft deterrent:

- Horn relay
- Exterior lamps
- Alarm siren

Section 11

Seats

Power Seats **11-2**

Schematic and Routing Diagrams **11-2**

Driver Seat Schematics 11-3

Passenger Seat Schematics 11-7

Description and Operation **11-9**

Lumbar Support Description and Operation 11-9

Lumbar Support/Massage Description and Operation (4-Way) 11-9

Lumbar Support/Massage Description and Operation (2-Way) 11-10

Lumbar Support/Massage Description and Operation (Lumbar and Massage) 11-10

Memory Seats Description and Operation 11-11

Power Seats System Description and Operation 11-12

Seat Heating and Cooling **11-14**

Schematic and Routing Diagrams **11-14**

Heated/Cooled Seat Schematics 11-15

Description and Operation **11-20**

Heated/Vented Seat Description and Operation 11-20

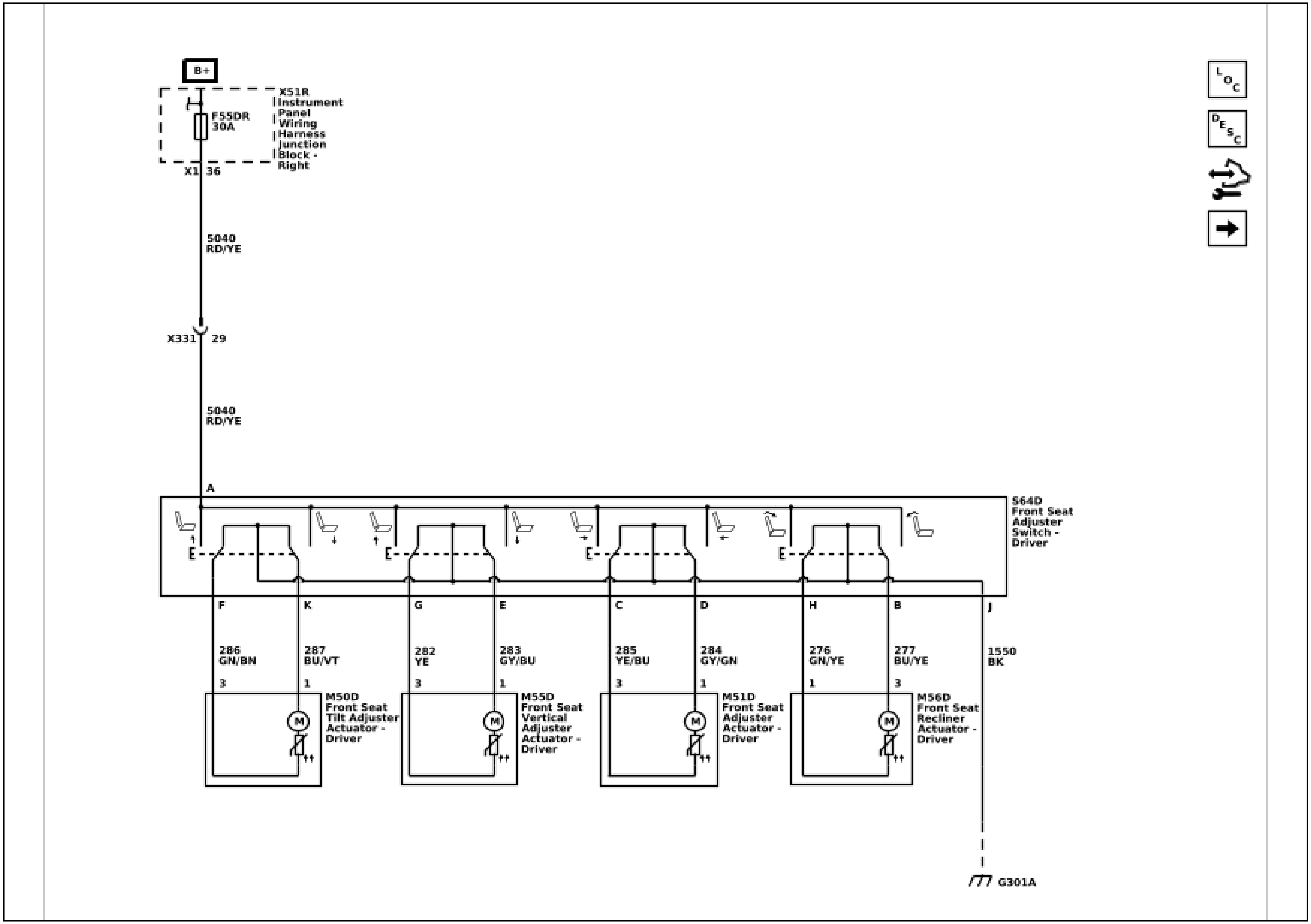
Rear Heated Seats Description and Operation 11-21

Seats

Power Seats

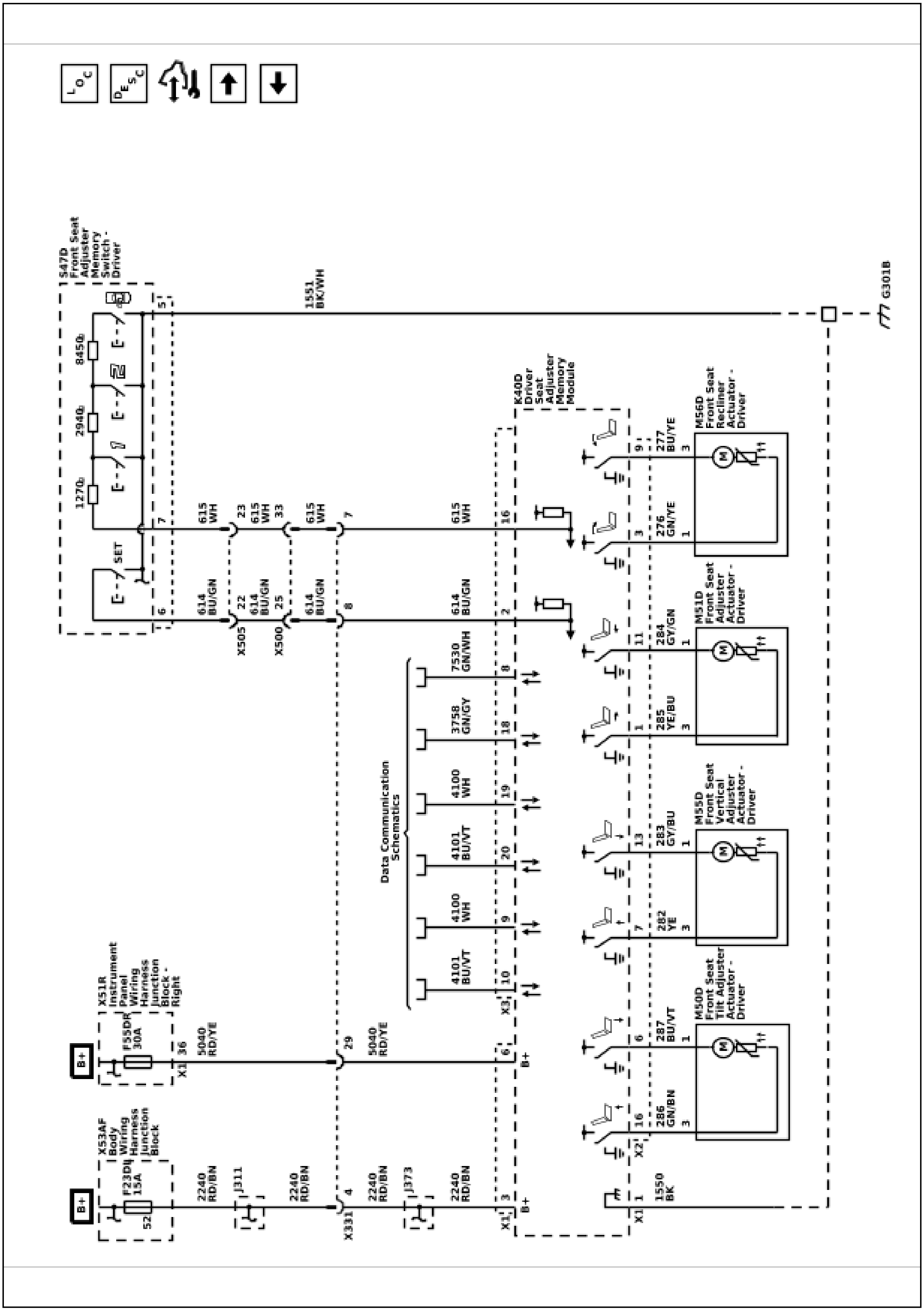
Schematic and Routing Diagrams

Driver Seat Schematics (Power Seat (- A45))

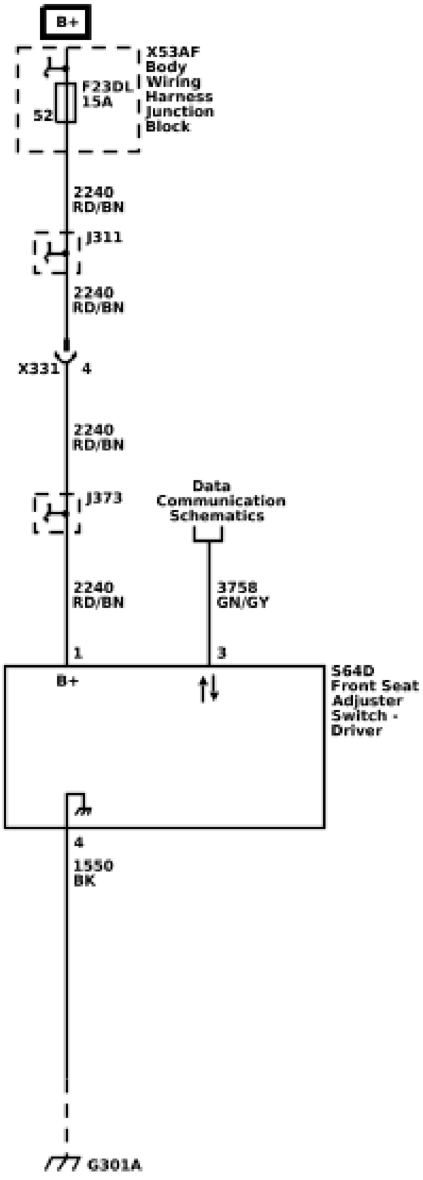

B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F55DR 30A
X1 36
5040 RD/YE
X331 29
5040 RD/YE
A
S64D Front Seat Adjuster Switch - Driver
F
K
G
E
C
D
H
B
J
286 GN/BN
287 BU/VT
282 YE
283 GY/BU
285 YE/BU
284 GY/GN
276 GN/YE
277 BU/YE
1550 BK
3
1
3
1
3
1
1
3
M
M50D Front Seat Tilt Adjuster Actuator - Driver
M55D Front Seat Vertical Adjuster Actuator - Driver
M51D Front Seat Adjuster Actuator - Driver
M56D Front Seat Recliner Actuator - Driver
G301A

6846429

Driver Seat Schematics (Module Power, Ground, Serial Data, Motors, and Memory Controls (A45))

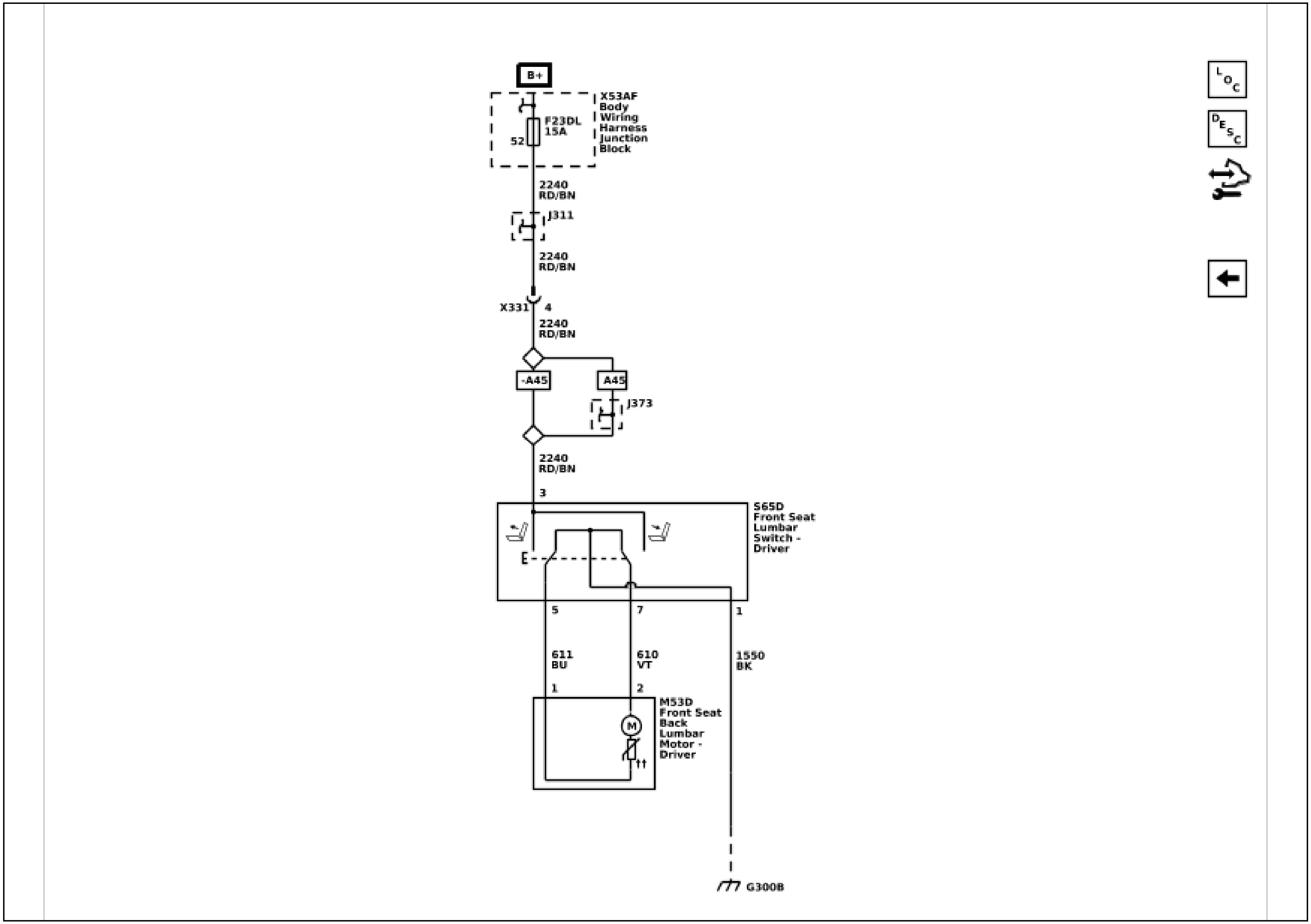

6846430
S47D Front Seat Adjuster Memory Switch - Driver
1270Ω
2940Ω
8450Ω
SET
1551 BK/WH
G301B
K40D Driver Seat Adjuster Memory Module
M56D Front Seat Recliner Actuator - Driver
M51D Front Seat Adjuster Actuator - Driver
M55D Front Seat Vertical Adjuster Actuator - Driver
M50D Front Seat Tilt Adjuster Actuator - Driver
277 BU/YE
276 GN/YE
284 GY/GN
285 YE/BU
283 GY/BU
282 YE
287 BU/VT
286 GN/BN
1550 BK
615 WH
614 BU/GN
X505
X500
Data Communication Schematics
7530 GN/WH
3758 GN/GY
4100 WH
4101 BU/VT
4100 WH
4101 BU/VT
X51R Instrument Panel Wiring Harness Junction Block - Right
F55DR 30A
5040 RD/YE
X53AF Body Wiring Harness Junction Block
F23DA 15A
2240 RD/BN
J311
J373
X331
X1
X2
X3
B+
M

Driver Seat Schematics (Seat Adjuster Switches (A45))

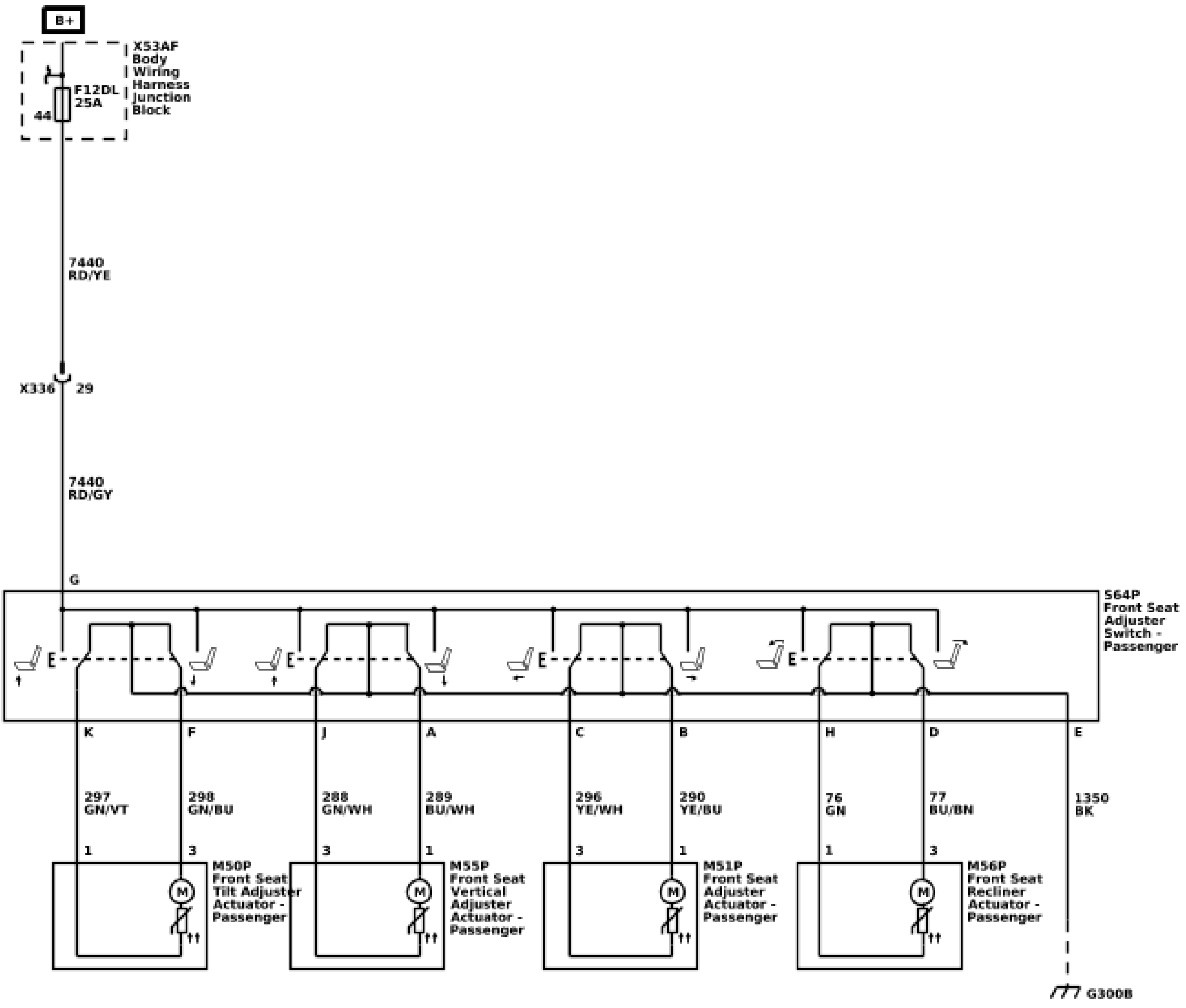

B+
X53AF
Body
Wiring
Harness
Junction
Block
F23DL
15A
52
2240
RD/BN
J311
2240
RD/BN
X331
4
2240
RD/BN
J373
Data
Communication
Schematics
2240
RD/BN
3758
GN/GY
1
3
B+
S64D
Front Seat
Adjuster
Switch -
Driver
4
1550
BK
G301A

6846431

Driver Seat Schematics (Seat Lumbar/Bolster (A45))

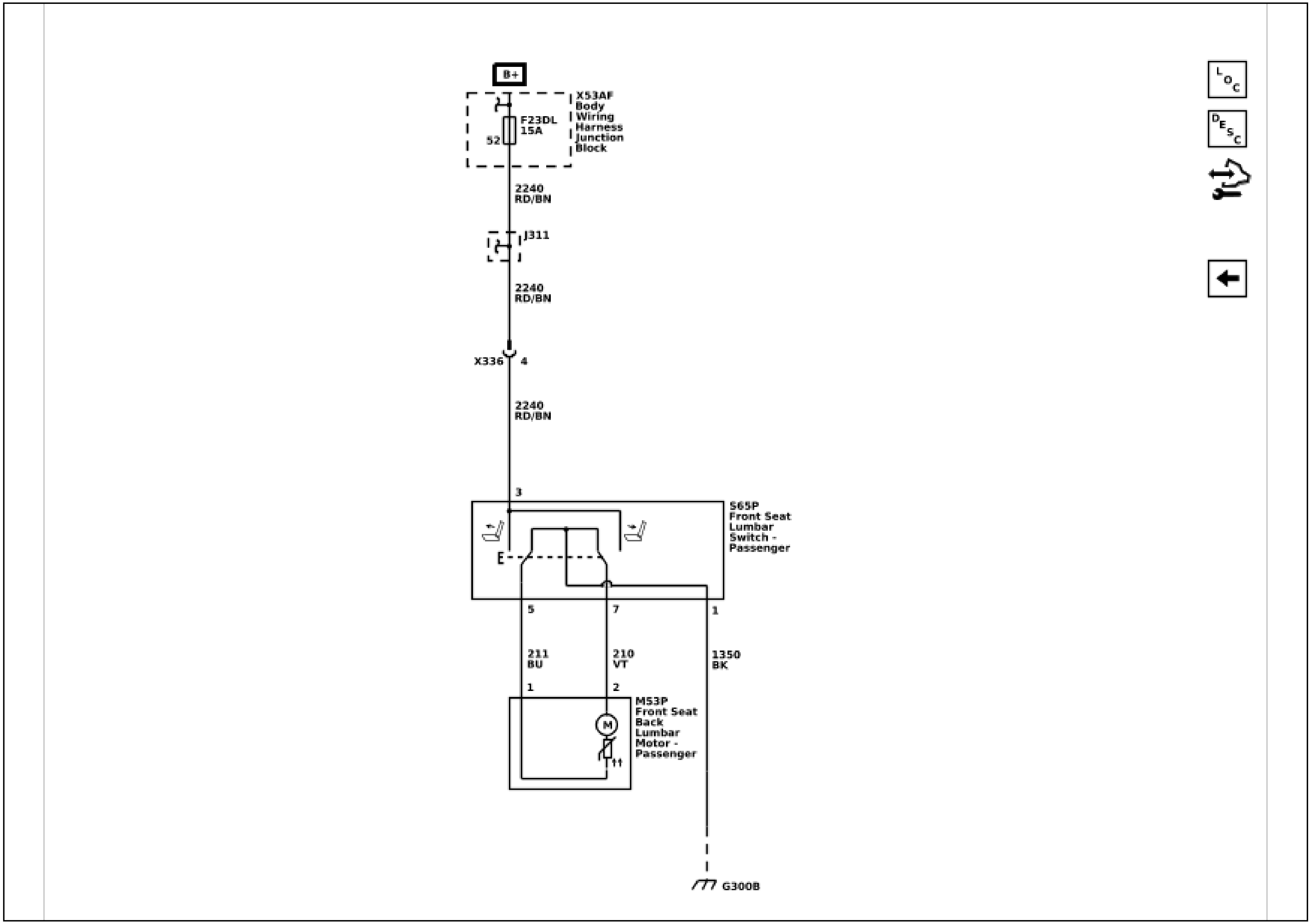

B+
X53AF
Body
Wiring
Harness
Junction
Block
F23DL
15A
52
2240
RD/BN
J311
2240
RD/BN
X331
4
2240
RD/BN
-A45
A45
J373
2240
RD/BN
3
S65D
Front Seat
Lumbar
Switch -
Driver
E
5
7
1
611
BU
610
VT
1550
BK
1
2
M53D
Front Seat
Back
Lumbar
Motor -
Driver
M
G300B
6846432

Passenger Seat Schematics (Seat Position (A7K))


B+
X53AF
Body
Wiring
Harness
Junction
Block
F12DL
25A
44
7440
RD/YE
X336
29
7440
RD/GY
G
S64P
Front Seat
Adjuster
Switch -
Passenger
E
K
F
J
A
C
B
H
D
E
297
GN/VT
298
GN/BU
288
GN/WH
289
BU/WH
296
YE/WH
290
YE/BU
76
GN
77
BU/BN
1350
BK
1
3
3
1
3
1
1
3
M
M50P
Front Seat
Tilt Adjuster
Actuator -
Passenger
M55P
Front Seat
Vertical
Adjuster
Actuator -
Passenger
M51P
Front Seat
Adjuster
Actuator -
Passenger
M56P
Front Seat
Recliner
Actuator -
Passenger
G300B

6846433

Passenger Seat Schematics (Lumbar (A7K))


B+
X53AF
Body
Wiring
Harness
Junction
Block
F23DL
15A
52
2240
RD/BN
J311
2240
RD/BN
X336
4
2240
RD/BN
3
S65P
Front Seat
Lumbar
Switch -
Passenger
E
5
7
1
211
BU
210
VT
1350
BK
1
2
M
M53P
Front Seat
Back
Lumbar
Motor -
Passenger
G300B
6846434

Description and Operation

Lumbar Support Description and Operation

The memory lumbar/bolster system uses air bladders to adjust various aspects of the seat configuration to meet an occupant’s preference. It also allows these adjustments to be stored to a memory position along with the seat position data.

Some vehicles may also be equipped with dynamic mode control which gives the chassis subsystem the ability to request an automatic adjustment to the seat's bolster support depending on vehicle driving conditions.

The various seat adjustments and functionality which may be possible include:

- Lumbar support – forward and rearward
- Seat back side bolster

The components of the system include:

- LIN based seat switch
- Driver Seat Adjuster Memory Module
- Front Seat Bolster Memory Module - Driver
- Air bladders

LIN Seat Switch

The seat switch communicates all customer requests for seat movement or adjustment via the LIN serial data bus to the seat adjuster memory module. The seat switch may consist of the following controls:

- Seat adjuster switch similar to the typical discrete seat switch
- 2-way lumbar switch which can be activated Forward/Rearward
- 2-way bolster switch which can be activated Up/Down

Manipulating the seat cushion and seat back control bar results in the seat memory control module responding in the same way as it would if the resultant requests were made by discrete signals instead of the LIN messaging this switch employs.

Lumbar/Bolster Operation

Once the lumbar/bolster feature has been activated, the Driver Seat Adjuster Memory Module will command the Front Seat Bolster Memory Module - Driver to perform the required pneumatic movements via LIN serial data messages.

The Front Seat Bolster Memory Module - Driver contains the electronic circuitry for executing the commanded pneumatic seat adjustments, air direction solenoids, pressure sensors for storing air bladder pressures, and an output which supplies battery power to the internal seat air pump motor when any of the air bladders require inflating.

Based on the LIN command from the Driver Seat Adjuster Memory Module, the Front Seat Bolster Memory Module - Driver the appropriate air solenoids and activates or deactivates the internal air pump in order to inflate or deflate the air bladders in the correct combination. When an air bladder needs inflating its solenoid opens and the pump motor is activated pumping air into the bladder. When an air bladder needs deflating its solenoid opens the release valve and air is allowed to bleed out of the bladder into the vehicle cabin.

To support memory recall, the Front Seat Bolster Memory Module - Driver uses internal air pressure sensors to track, store and recall the positions of all the air bladders under its control.

Lumbar Support/Massage Description and Operation (4-Way)

Lumbar Support Components

The driver and front passenger pneumatic lumbar support system each consist of the following components:

- Seat lumbar support switch
- Seat lumbar support control module
- Seat lumbar/bolster pump

Circuit Description

Battery voltage is supplied at all times to the seat lumbar support control module through a 10 A fuse located in the fuse block. Ground is also supplied at all times to the seat lumbar support control module and the seat lumbar/bolster pump.

The driver seat lumbar support switch is a resistive ladder switch. The seat lumbar support control module supplies the seat lumbar support switch with a signal and low reference circuits. When a lumbar switch is pressed, the signal circuit from the seat lumbar support control module is pulled low through the switch contacts and series of resistors indicating the lumbar support request. In response to this request, the seat lumbar support control module energizes its internal inflate solenoid and applies battery voltage through the lumbar support pump control circuit to the pump. The pump runs to inflate the appropriate support bladder until the switch is released.

Description of Operation

The following describes the lumbar support operation and how the seat lumbar support control module responds to each of the lumbar support switch inputs:

- When the lumbar support switch pressed in the FORWARD direction, the seat lumbar support control module will command the lumbar support pump ON and the upper and lower lumbar support bladders should inflate until the bladders are 100% inflated or the switch is released.
- When pressing the lumbar support switch in the REARWARD direction, the seat lumbar support control module will slowly deflate the upper and lower lumbar support bladders until the switch is released or both bladders are 100% deflated.
- When the lumbar support switch is pressed in the UP direction, the seat lumbar support control module will slowly inflate the upper lumbar support bladder until the switch is released or the bladder is 100% inflated.
- When the lumbar support switch is pressed in the DOWN direction, the seat lumbar support control module will slowly deflate the upper lumbar bladder while it inflates the lower lumbar bladder. The seat lumbar support control module will continue this operation until the switch is released or the upper lumbar bladder is 100% deflated and the lower lumbar bladder is 100% inflated.

Lumbar Support/Massage Description and Operation (2-Way)

Lumbar Support Components

The power seat lumbar support systems consist of the following components:

- S65 Front Seat Lumbar Switch
- M53 Front Seat Back Lumbar Motor

The seat lumbar switch provides both power and ground to the lumbar support motor. The motor contains an electronic circuit breaker (PTC) that will reset only after voltage has been removed from the motor. The motor moves the lumbar support forward and rearward.

When the lumbar switch is operated to move the lumbar support rearward, battery positive voltage is applied through the lumbar rearward switch contacts and the lumbar motor rearward control circuit to the lumbar support motor. The motor is grounded through the lumbar forward switch contacts and the lumbar motor forward control circuit to the motor. The motor runs to drive the lumbar support rearward away from the occupant's back until the switch is released. Moving the lumbar support forward works similarly to moving the lumbar support rearward, except that battery positive voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction.

Lumbar Support/Massage Description and Operation (Lumbar and Massage)

The memory lumbar/bolster/massage system uses air bladders to adjust various aspects of the seat configuration to meet an occupant’s preference. It also allows these adjustments/types/intensities to be stored to a memory position along with the stored seat position.

Some vehicles may also be equipped with dynamic mode control which gives the chassis subsystem the ability to request an automatic adjustment to the seat's bolster support depending on vehicle driving conditions.

The various seat adjustments and functionality which may be possible include:

- Lumbar support – forward and rearward
- Lumbar support – up and down
- Seat back side bolster – in and out
- Back massage – type(s) and intensity (intensities)
- Cushion side bolster – in and out

The components of the system include:

- LIN based seat switch
- Seat adjuster memory module
- Bolster memory control module
- Seat air pump motor
- Air bladders
- Information display (If applicable)

LIN Seat Switch

The seat switch communicates all customer requests for seat movement or adjustment via the LIN serial data bus to the seat adjuster memory module. The seat switch may consist of the following controls:

- Seat adjuster switch similar to the typical discrete seat switch
- Massage On/Off switch, if massage is equipped
- 4-way lumbar switch which can be activated Up/Down/Forward/Rearward
- 2-way bolster switch which can be activated Up/Down

Lumbar/Bolster Operation

Note: When the Ignition Off, it is normal operation for bladders to deflate.

Once the lumbar/bolster feature has been activated, the seat adjuster memory module will command the seat bolster memory control module to perform the required pneumatic movements via LIN serial data messages.

The seat bolster memory control module contains the electronic circuitry for executing the commanded pneumatic seat adjustments, air direction solenoids, pressure sensors for storing air bladder pressures, and an output which supplies battery power to the external seat air pump motor when any of the air bladders require inflating.

Based on the LIN command from the seat adjuster memory module, the seat bolster memory control module controls the appropriate air solenoids and activates or deactivates the external air pump in order to inflate or deflate the air bladders in the correct combination. When an air bladder needs inflating its solenoid opens and the pump motor is activated pumping air into the bladder. When an air bladder needs deflating its solenoid opens the release valve and air is allowed to bleed out of the bladder into the vehicle cabin.

To support memory recall and massage, the seat bolster memory control module uses internal air pressure sensors to track, store and recall the positions of all the air bladders under its control.

The massage On/Off switch on the LIN seat switch allows the customer to turn the massage feature on and off.

Memory Seats Description and Operation

The memory seat system consists of the following components:

- K40 Seat memory control module
- S64 Seat adjuster switch
- S47 Seat memory switch
- M51 Seat horizontal motor
- M50 Seat front vertical motor
- M55 Seat rear vertical motor
- M56 Seat recline motor

Driver Seat Adjuster Switch

The seat memory control module supplies a low current voltage to each signal circuit of the seat adjuster switch. When the driver seat adjuster switches are pressed, the appropriate signal circuit from the seat memory control module is pulled low through the switch contacts indicating the power seat command. The seat memory control module then commands the appropriate driver seat motor to move in response to the switch signal.

Seat Memory Control Module Power and Grounds

Battery voltage is supplied at all times to the seat memory control module through two different circuits. One circuit is used by the module to apply power to the driver seat motors and lumbar motors, if equipped, when commanded ON. The second battery voltage circuit is used to power up module and supply a reference voltage to the seat position sensors. Ground is provided to the seat memory control module through a single ground circuit and ground connection.

Seat Motors

There are 4 motors that move the position of the seat. These are the seat horizontal motor, seat front vertical motor, seat rear vertical motor, and the seat back recline motor. The horizontal motor moves the entire seat forward and rearward. The seat front vertical motor moves the front of the seat cushion up or down. The seat rear vertical motor moves the rear of the seat cushion up and down. Due to the seat adjuster switch design the front tilt and the seat height adjuster motor cannot be operated at the same time The recline motor moves the angle of the seat back forward or rearward.

The seat memory control module controls all seat and lumbar motors via half bridges that are connected to a single power rail internal to the module. The module connects all seat and lumbar motor outputs to a common ground whenever they are not in operation. The seat memory control module checks to see if any motor control circuits are shorted to ground or voltage before enabling any seat or lumbar motor. All of the motors operate independently of each other. Each motor contains a electronic circuit breaker (PTC), which will reset only after voltage has been removed from the motor.

All seat motors are reversible. For example, when a seat switch is pressed to move the entire seat forward, ground is applied through the switch contacts onto the seat horizontal forward switch signal circuit to the seat memory control module. In response to this signal, the module applies battery voltage through the driver seat horizontal motor forward control circuit and ground through the driver seat horizontal motor rearward control circuit to the motor. The motor runs in order to drive the entire seat forward. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on the opposite circuits causing the motor to run in the opposite direction. All of the motors are powered this way.

Position Sensors

To monitor seat position, each seat motor has an internal 2-wire hall-effect position sensor. The seat memory control module supplies all the sensors with a common 12 V reference when the seat is moving and a unique signal circuit for each sensor. During seat motor operation, the position sensors provide a specific number of pulse signals for every revolution of the motor shaft.

The seat memory control module determines seat position by keeping a running counter where movement in the forward/upward direction adds counts and movement in the rearward/down direction subtracts counts. The value of the counter will be in the range of 0 – 65,535

The value of these counters, which represent seat positions, are stored in memory for future seat memory recall operation. During a memory seat position recall, the seat memory control module moves the seat in such a way to return it the stored counter value.

Memory Functions

In all power modes except crank, memory recalls can be initiated by pressing and holding one of the memory position buttons until the seat reaches the stored memory position associated with the activated button. This is called a supervised recall.

The seat memory control module supplies a ground at all times through a low reference circuit to the driver seat memory switch. The module also supplies memory set and memory recall signal circuits to the seat memory switch. When a memory recall switch is pressed, the signal circuit from the seat memory control module is pulled low through the switch contacts and a series of resistors indicating the memory recall request. In response to this signal, the seat memory control module commands the appropriate seat motors to move to the pre-recorded seat positions stored in memory.

Refer to the Owner’s Manual for storing memory positions.

Auto Memory Recall and Easy Exit

The seat memory control module will not perform Auto Memory Seat Recall and Easy Exit functions unless these options are enabled in vehicle personalization using the radio/HVAC controls.

Refer to Instruments and Controls/Vehicle Personalization in the Owner’s Manual for the following memory personalization options:

- Auto Memory Recall
- Easy Exit Options

The radio/HVAC controls reports the auto memory recall option settings to the seat memory control module via serial data message. The module will then store the memory recall option setting and examine it before making a memory seat adjustment. The auto memory recall option setting stored within the module will not change until the auto memory recall option setting in vehicle personalization is changed.

Power Seats System Description and Operation

The driver and passenger power seat systems each consist of the following components:

- Seat adjuster switch
- Seat horizontal motor
- Seat front vertical motor (If Equipped)
- Seat rear vertical motor
- Seat recline motor

Seat Motors

The seat switches provide both power and ground to the selected seat motors.

All of the seat motors operate independently of each other. Each motor contains an electronic circuit breaker (PTC) that opens in the event of a circuit overload and will reset only after voltage has been removed from the circuit. There are four seat position motors and two lumbar motors. These are the horizontal motor, front vertical motor, rear vertical motor, and the seat back recline motor. The seat horizontal motor moves the entire seat forward and rearward. The seat vertical motors may operate independently to tilt the front or rear of the seat cushion up or down. Both motors can also run simultaneously to move the entire seat up or down. The recline motor moves the angle of the seat back forward or rearward.

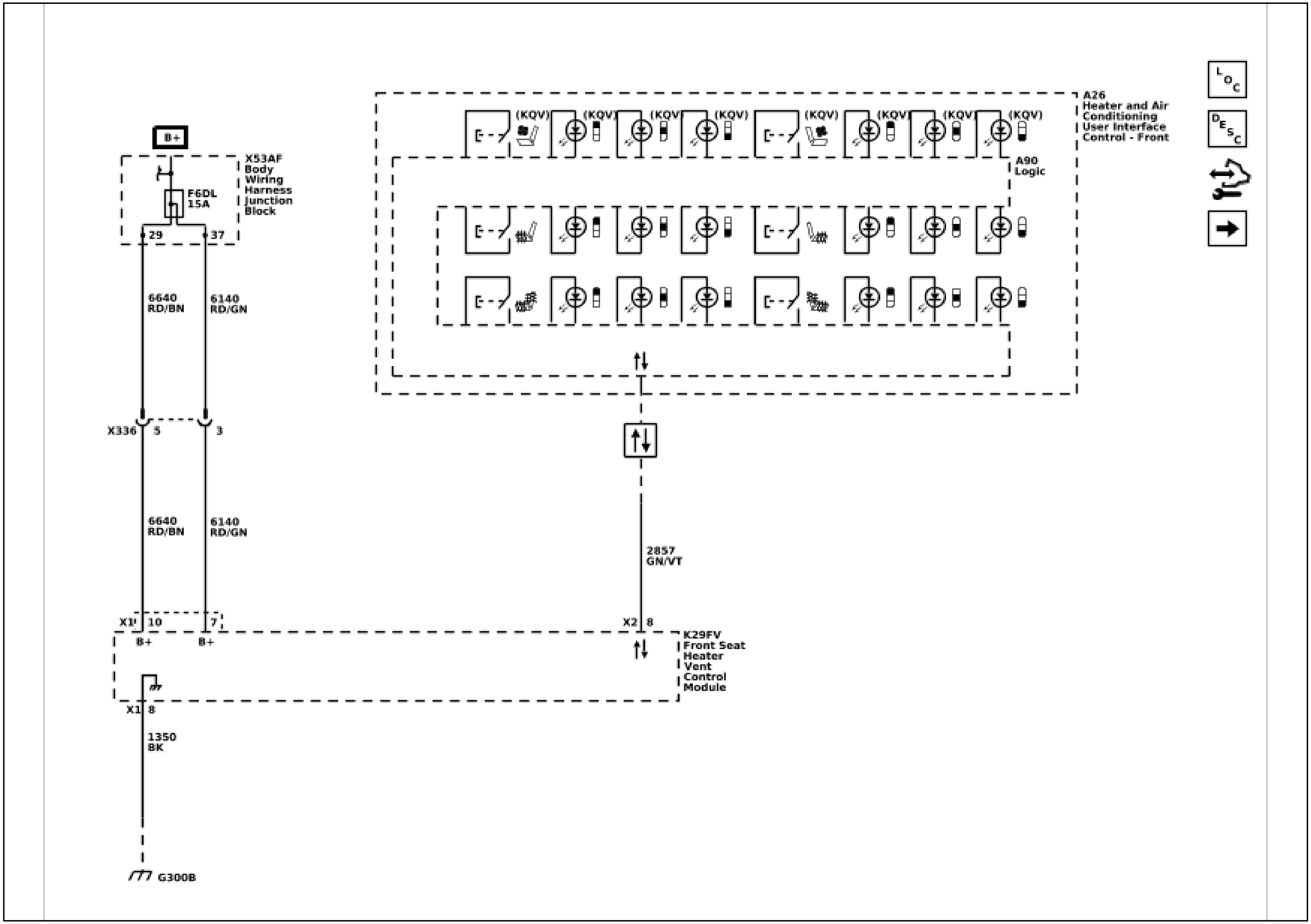
Seat Operation

All seat motors are reversible. For example, when the seat horizontal forward switch is pressed to move the entire seat forward, battery voltage is applied through the switch contacts and the seat horizontal motor forward control circuit to the motor. With the horizontal motor rearward switch contacts closed to the switch ground circuit, the motor runs in order to drive the entire seat forward until the switch is released. Moving the entire seat rearward works similarly to moving the entire seat forward, except that battery voltage and ground are applied on opposite circuits causing the motor to run in the opposite direction. All seat motors are powered this way.

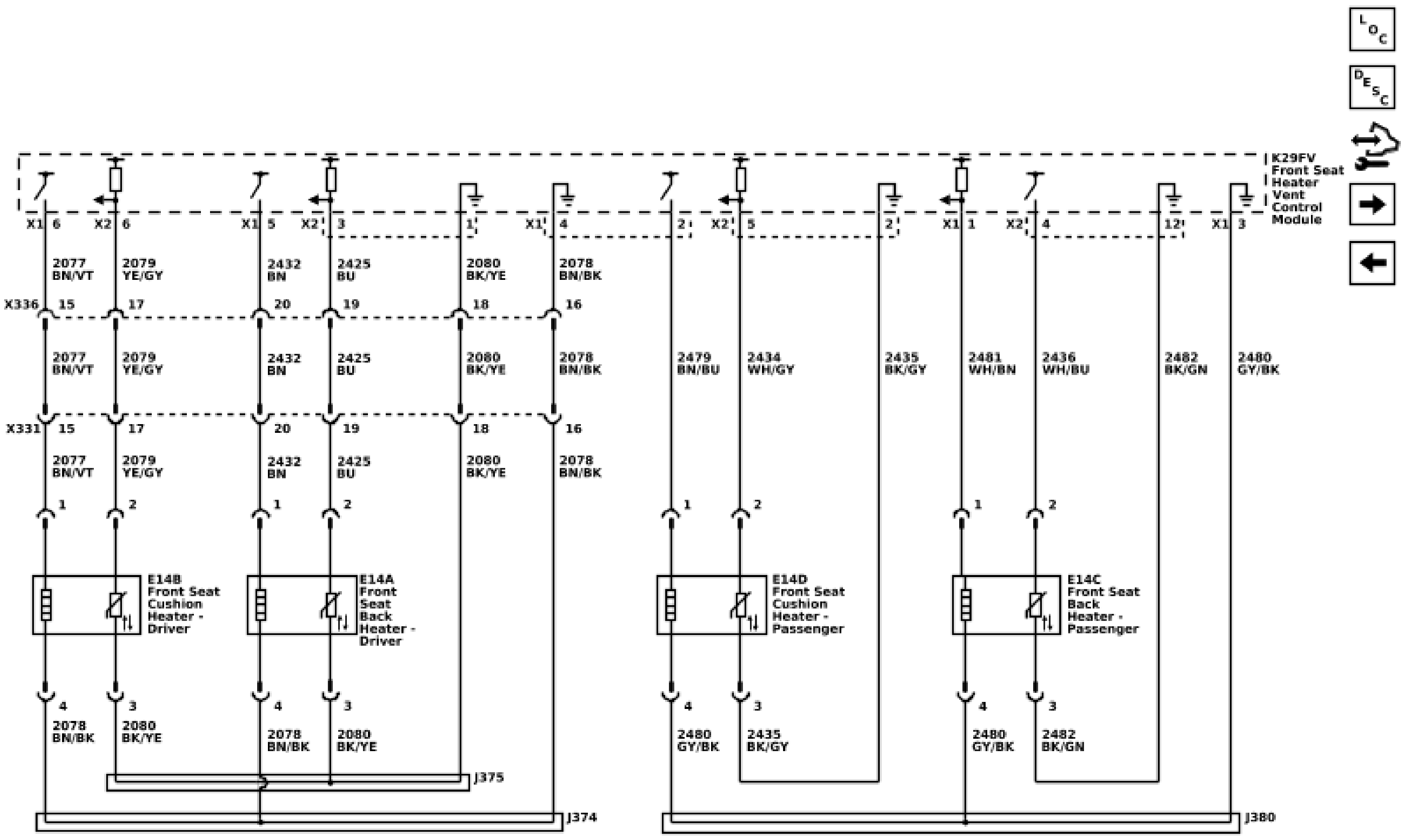
Seat Heating and Cooling

Schematic and Routing Diagrams

Heated/Cooled Seat Schematics (Front Seat Heating Control Module Power, Ground, Serial Data, and Controls (KA1))

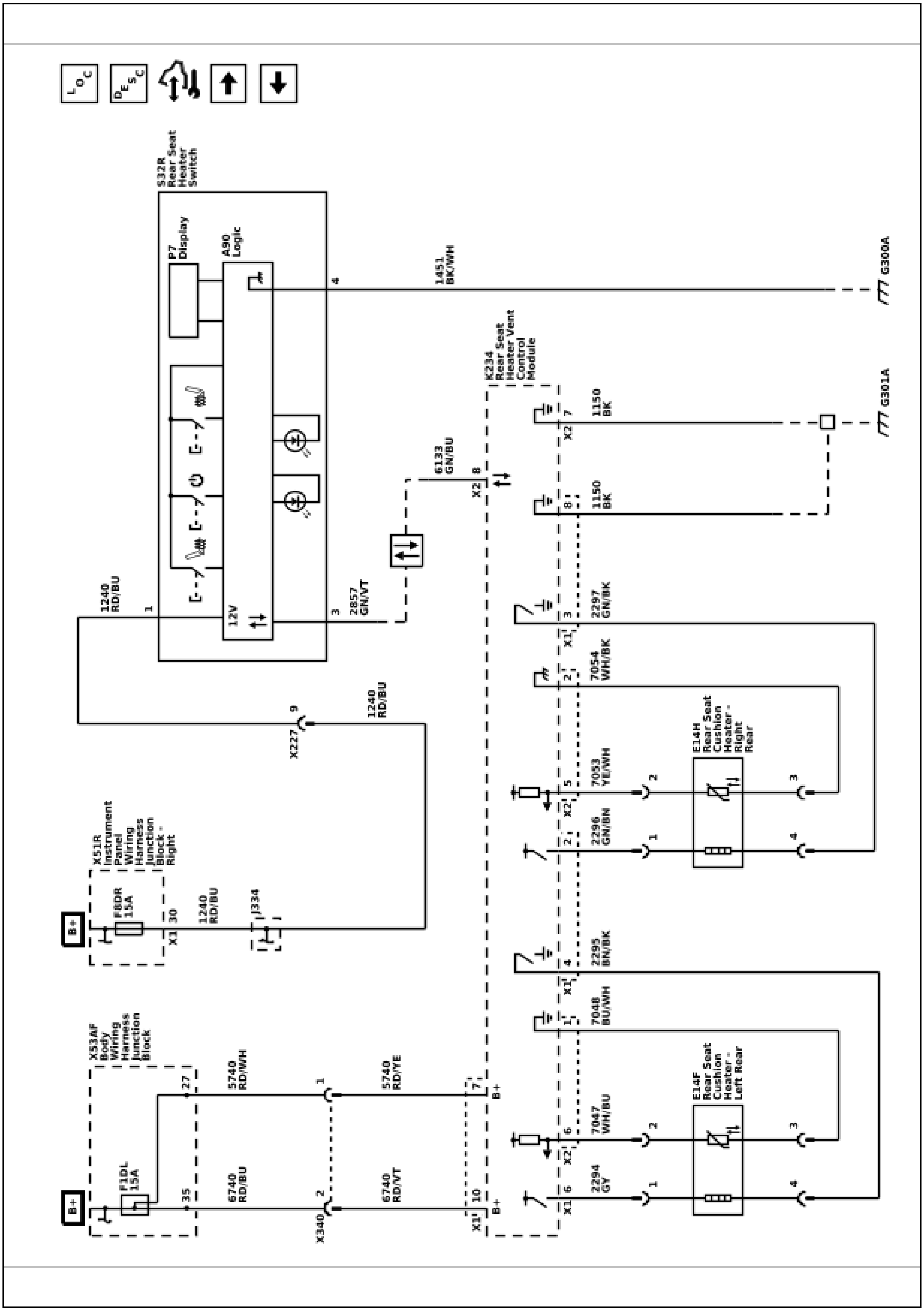

A26
Heater and Air Conditioning User Interface Control - Front
A90
Logic
(KQV)
(KQV)
(KQV)
(KQV)
(KQV)
(KQV)
(KQV)
(KQV)
B+
X53AF
Body Wiring Harness Junction Block
F6DL
15A
29
37
6640
RD/BN
6140
RD/GN
X336
5
3
6640
RD/BN
6140
RD/GN
2857
GN/VT
X1
10
7
X2
8
B+
B+
K29FV
Front Seat Heater Vent Control Module
X1
8
1350
BK
G300B
6846435

Heated/Cooled Seat Schematics (Heated Seat Elements - Front (KA1))


LOC
DESC
K29FV Front Seat Heater Vent Control Module
X1 6
X2 6
X1 5
X2 3
1
X1 4
2
X2 5
2
X1 1
X2 4
12
X1 3
2077 BN/VT
2079 YE/GY
2432 BN
2425 BU
2080 BK/YE
2078 BN/BK
X336
15
17
20
19
18
16
2479 BN/BU
2434 WH/GY
2435 BK/GY
2481 WH/BN
2436 WH/BU
2482 BK/GN
2480 GY/BK
X331
1
2
E14B Front Seat Cushion Heater - Driver
E14A Front Seat Back Heater - Driver
E14D Front Seat Cushion Heater - Passenger
E14C Front Seat Back Heater - Passenger
4
3
J375
J374
J380

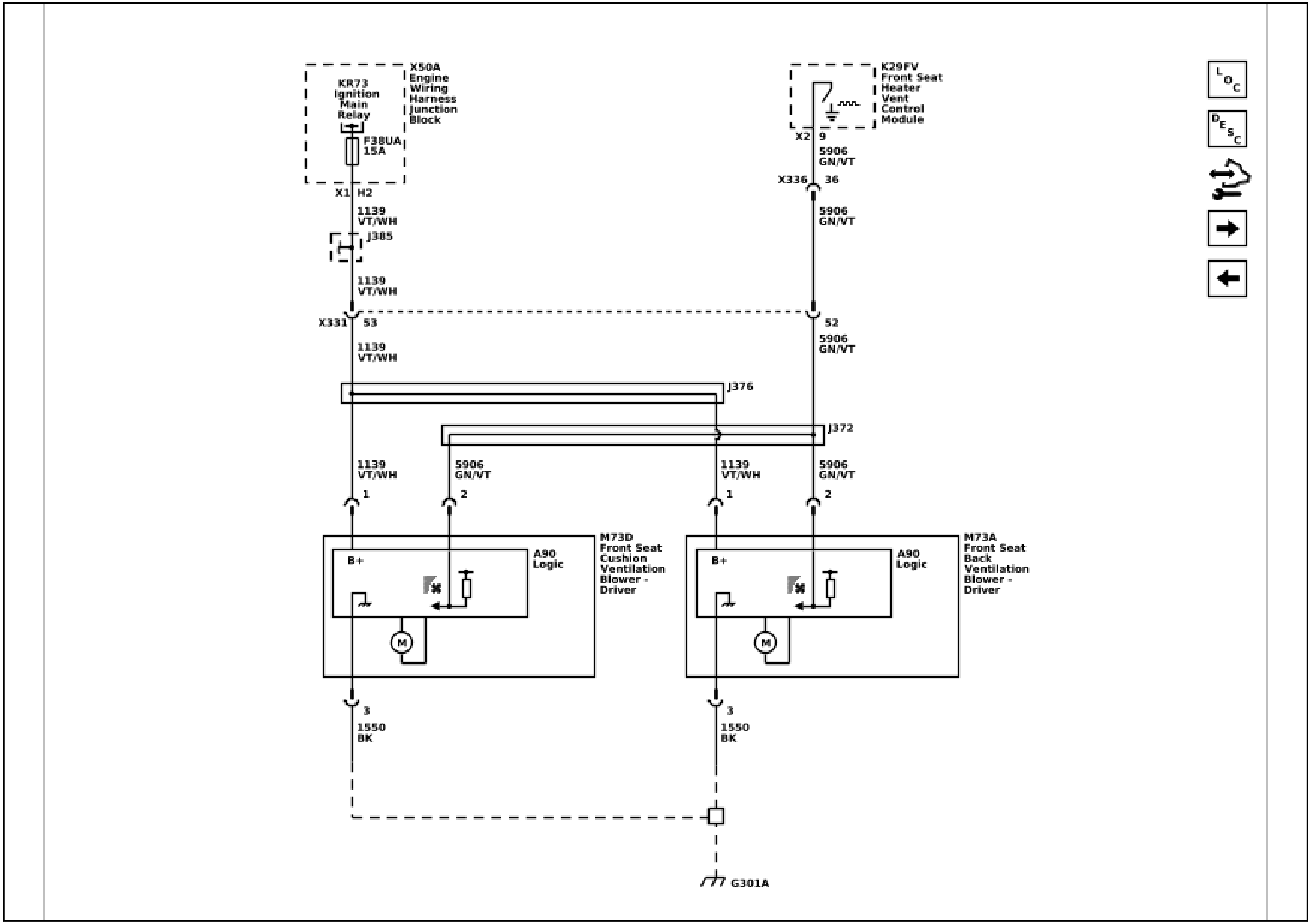
6846436

Heated/Cooled Seat Schematics (Heated Seats - Rear (KA6))

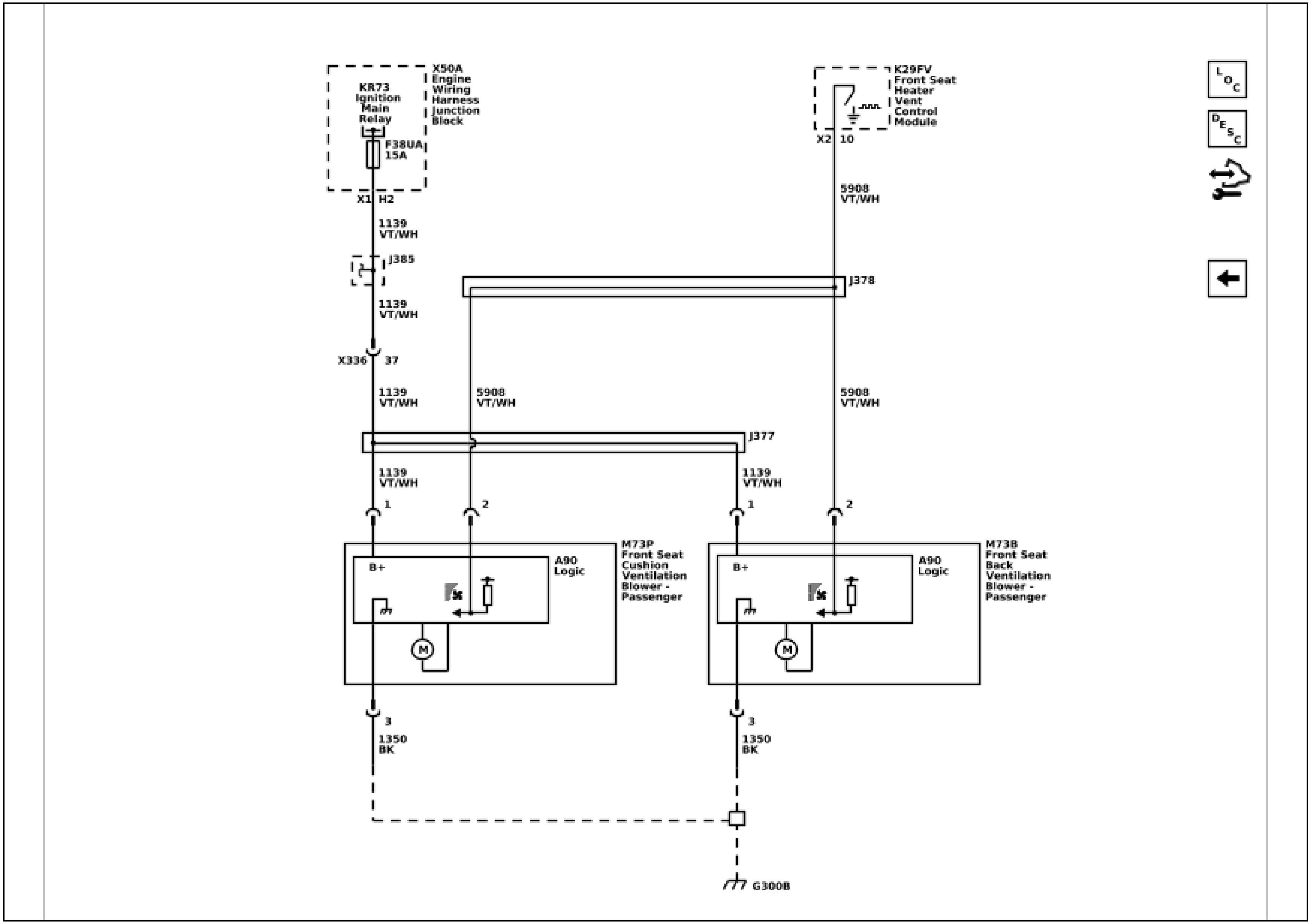

L O C
D E S C
S32R Rear Seat Heater Switch
P7 Display
A90 Logic
12V
1
3
4
1240 RD/BU
2857 GN/VT
1451 BK/WH
G300A
6133 GN/BU
X2 8
K234 Rear Seat Heater Vent Control Module
X2 7
1150 BK
8
1150 BK
G301A
X1 3
2297 GN/BK
2
7054 WH/BK
X227 9
1240 RD/BU
E14H Rear Seat Cushion Heater - Right Rear
X2 5
7053 YE/WH
2
2296 GN/BN
1
2
3
4
X51R Instrument Panel Wiring Harness Junction Block - Right
B+
F8DR 15A
X1 30
1240 RD/BU
J334
X1 4
2295 BN/BK
1
7048 BU/WH
X53AF Body Wiring Harness Junction Block
27
5740 RD/WH
1
5740 RD/YE
7
B+
E14F Rear Seat Cushion Heater - Left Rear
X2 6
7047 WH/BU
2
3
B+
F1DL 15A
35
6740 RD/BU
X340 2
6740 RD/VT
X1 10
B+
X1 6
2294 GY
1
4

6846437

Heated/Cooled Seat Schematics (Ventilated Seats - Driver (KQV))


X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F38UA 15A
X1 H2
1139 VT/WH
J385
1139 VT/WH
X331 53
1139 VT/WH
J376
J372
K29FV Front Seat Heater Vent Control Module
X2 9
5906 GN/VT
X336 36
5906 GN/VT
52
5906 GN/VT
1139 VT/WH
1
5906 GN/VT
2
1139 VT/WH
1
5906 GN/VT
2
B+
A90 Logic
M
M73D Front Seat Cushion Ventilation Blower - Driver
B+
A90 Logic
M
M73A Front Seat Back Ventilation Blower - Driver
3
1550 BK
3
1550 BK
G301A
6846438

Heated/Cooled Seat Schematics (Ventilated Seats - Passenger (KQV))


X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F38UA 15A
X1 H2
1139 VT/WH
J385
1139 VT/WH
X336 37
1139 VT/WH
K29FV Front Seat Heater Vent Control Module
X2 10
5908 VT/WH
J378
5908 VT/WH
5908 VT/WH
J377
1139 VT/WH
1139 VT/WH
1
2
1
2
B+
A90 Logic
M73P Front Seat Cushion Ventilation Blower - Passenger
M
B+
A90 Logic
M73B Front Seat Back Ventilation Blower - Passenger
M
3
1350 BK
3
1350 BK
G300B

6846439

Description and Operation

Heated/Vented Seat Description and Operation

Heated and Vented Seat Components

The heated/vented seat system consists of the following components:

- Heated and vented seat switches
- Body control module
- Front seat heater control module
- Driver seat cushion heating element
- Driver seat cushion temperature sensor
- Driver seat back heating element
- Driver seat back temperature sensor
- Driver seat cushion blower motor
- Driver seat back blower motor
- Passenger seat cushion heating element
- Passenger seat cushion temperature sensor
- Passenger seat back heating element
- Passenger seat back temperature sensor
- Passenger seat cushion blower motor
- Passenger seat back blower motor

Heated/Vented Seat Switches

The driver and passenger heated and vented seat switches are located near the HVAC controls on the center stack. The BCM is the heated and vented seat system master. It monitors heated/vented seat switch activations to determine user requested operating mode. Based on the requested operating mode, the BCM sends a LIN Bus serial data message to the front seat heater control module how to drive the self-regulated heating pads or ventilation motors. The BCM also controls the indicators used to provide the operator with feedback as to the operating status of the system. With each press of the switch, the system will cycle through High, Medium, Low, and then back to Off again. The BCM also controls the seat temperature and mode indicators, via the serial data line, used to provide the operator with feedback as to the operating status of the system.

Heated Seat Operation

The front seat heater control module controls heated seat operation for the driver and passenger seats. When active, power is applied to the seat cushion and back heater elements through a common pulse width modulated (PWM) voltage supply control circuit. Each individual heater element is switched to ground by the module through a common low side drive control circuit.

When inactive the front seat heater control module connects the heating element low side outputs to a common reference point internal to the module which is biased to approximately 3.5 V. The module uses this biased voltage in order to check the high side and low side control circuits for a short to battery or ground before enabling the driver and passenger seat heating elements. During heated seat operation, the front seat heater control module interrupts control of the heating elements every 10 s for approximately 10 ms to make this biased voltage check.

With both the seat cushion and seat back heater elements disconnected, if the high side output of the module is measured it will display a low current 12 V bleed off voltage. This bleed off voltage does not have a meaningful diagnostic purpose. With one or both of the heater elements connected you would just see the 3.5 V biased voltage from this circuit.

Temperature Regulation

The seat back and cushion temperature sensors (thermistors) are packaged with the seat heating elements located just under the seat covers. The front seat heater control module supplies each temperature sensor with a 5 V reference signal circuit and a low reference circuit. The module monitors the voltage from the signal circuit to determine the temperature of the seat.

The temperature sensor varies in resistance based on the temperature of the heating element causing the signal voltage to change. Once the module senses the seat reached the set temperature, it will then begin regulate the current flow through the heater elements in order to maintain the desired seat temperature based on the feedback voltage from the sensor.

If the heated seats are on high, the temperature level may automatically be lowered after approximately 30 min of operation.

Vented Seat Operation

Each vented seat consists of 2 blower motors, one in the seat back and one in the seat cushion. During vented seat operation, the vented seat blower motors draw cabin air in through channels in the foam pad and small holes in the seat covers to pull heat away from the occupant.

When the front seat heater control module receives a ventilation seat command, it sends a low side drive pulse width modulation (PWM) signal through the blower motor control circuit to the seat back and cushion blower motors indicating the seat ventilation command. The logic in the blower motors sets the blower speed to the switch set point. The blower motors run causing a cooling effect to the occupant.

Auto Heated Seat Operation with Vehicle ON

Refer to Heated and Ventilated Front Seats and Vehicle Personalization in the Owner's Manual for information regarding Auto Heated and Ventilation Seat operation.

Heated and Cooled Seat Operation During Remote Start

Refer to Vehicle Personalization in the Owner's Manual for Remote Start Auto Heated and Ventilation Seats.

During remote start, the heated seats will turn ON when the ambient temperature is below 10° C (50° F).

During remote start, the seat ventilation system will turn ON when the ambient temperature is above 27° C (80° F).

Load Shed Management

The electrical power management function is designed to monitor the vehicle electrical load and determine when the battery is potentially in a high discharge condition. The heated seat system is one of the vehicle loads that is subject to reduction during a battery discharge condition. For more information on load management refer to *Electrical Power Management Description and Operation 6-68*.

Rear Heated Seats Description and Operation

Heated Seat Components

The rear heated seat system consists of the following components:

- Rear heated seat switches
- Body control module
- Rear seat heating control module
- Left rear seat cushion heating element
- Left rear seat cushion temperature sensor
- Right rear seat cushion heating element
- Right rear seat cushion temperature sensor

Heated Seat Switches

When a heated seat switch is pressed, the heated seat switch signal circuit from the body control module (BCM) is pulled low indicating the heated seat command. The BCM serves as the heated seat system master to determine the requested operating mode. The BCM then sends a LIN bus serial data message to the rear seat heating control module indicating the heated seat command. In response to this message, the seat heating control module attempts to drive the appropriate seat heating element per the BCM command.

Rear Heated Seat Operation

The rear seat heating control module controls heated seat operation for the left and right rear seats. When active, power is applied to the seat cushion and back heater elements through a common pulse width modulated (PWM) voltage supply control circuit. Each individual heater element is switched to ground by the module through a common low side drive control circuit.

When inactive the rear seat heating control module connects the heating element low side outputs to a common reference point internal to the control module which is biased to approximately 3.5 V. The control module uses this biased voltage in order to check the high side and low side control circuits for a short to battery or ground before enabling either the left or right rear seat heating element. During heated seat operation, the control module interrupts control of the heating elements every 10 s for approximately 10 ms to make this biased voltage check.

Temperature Regulation

The seat cushion temperature sensor (thermistors) is packaged with the seat heating element located just under the seat cover. The rear seat heating control module supplies the temperature sensor with a 5 V reference signal circuit and a low reference circuit. The control module monitors the voltage from the signal circuit to determine the temperature of the seat.

The temperature sensor varies in resistance based on the temperature of the heating element causing the signal voltage to change. Once the rear seat heating control module senses the seat reached the set temperature, it will then begin regulate the current flow through the heater elements in order to maintain the desired seat temperature based on the feedback voltage from the sensor.

The temperature level may automatically be lowered after approximately 30 min of operation.

Section 12

Steering

Power Steering **12-2**
Schematic and Routing Diagrams **12-2**
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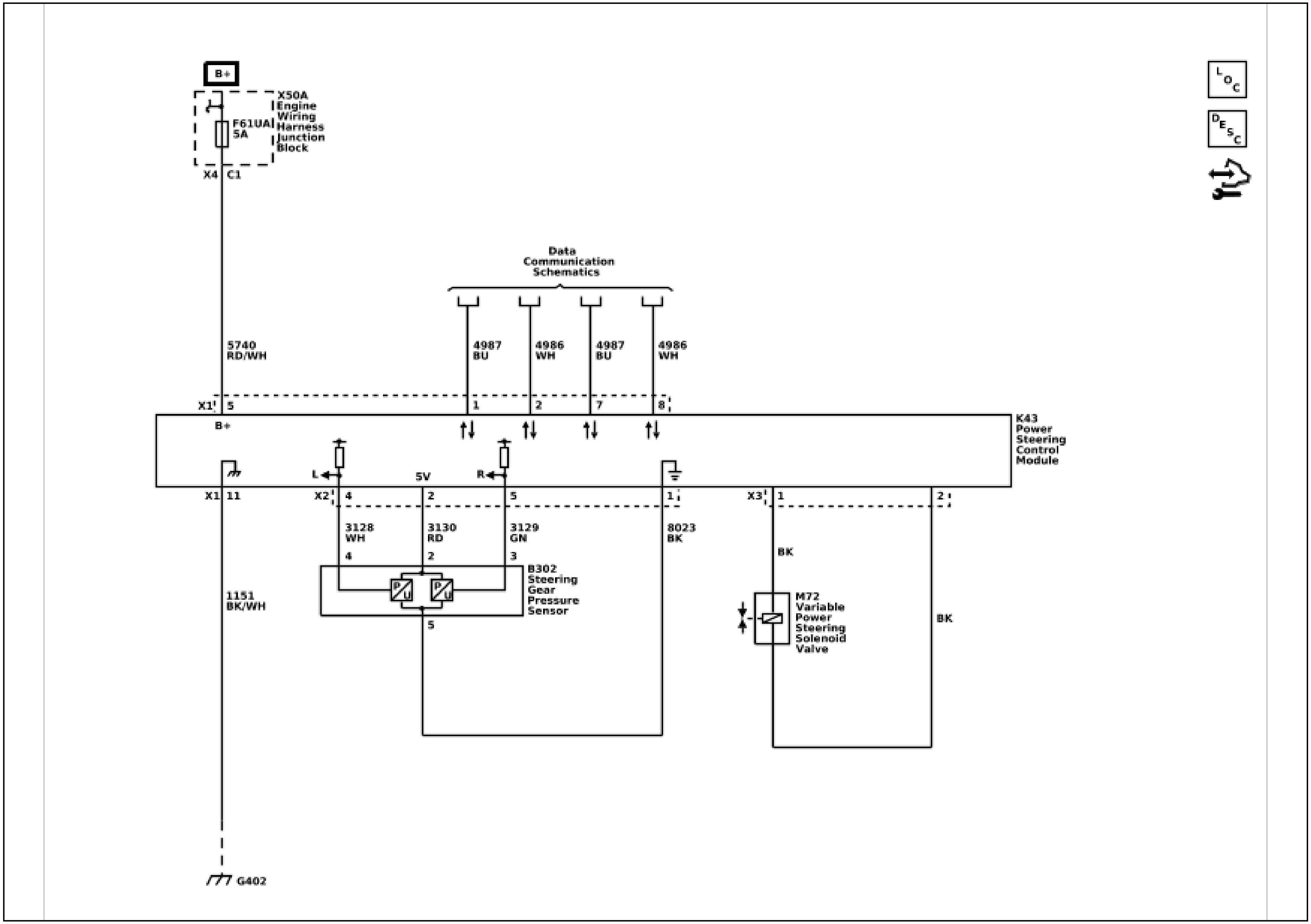
Steering

Power Steering

Schematic and Routing Diagrams

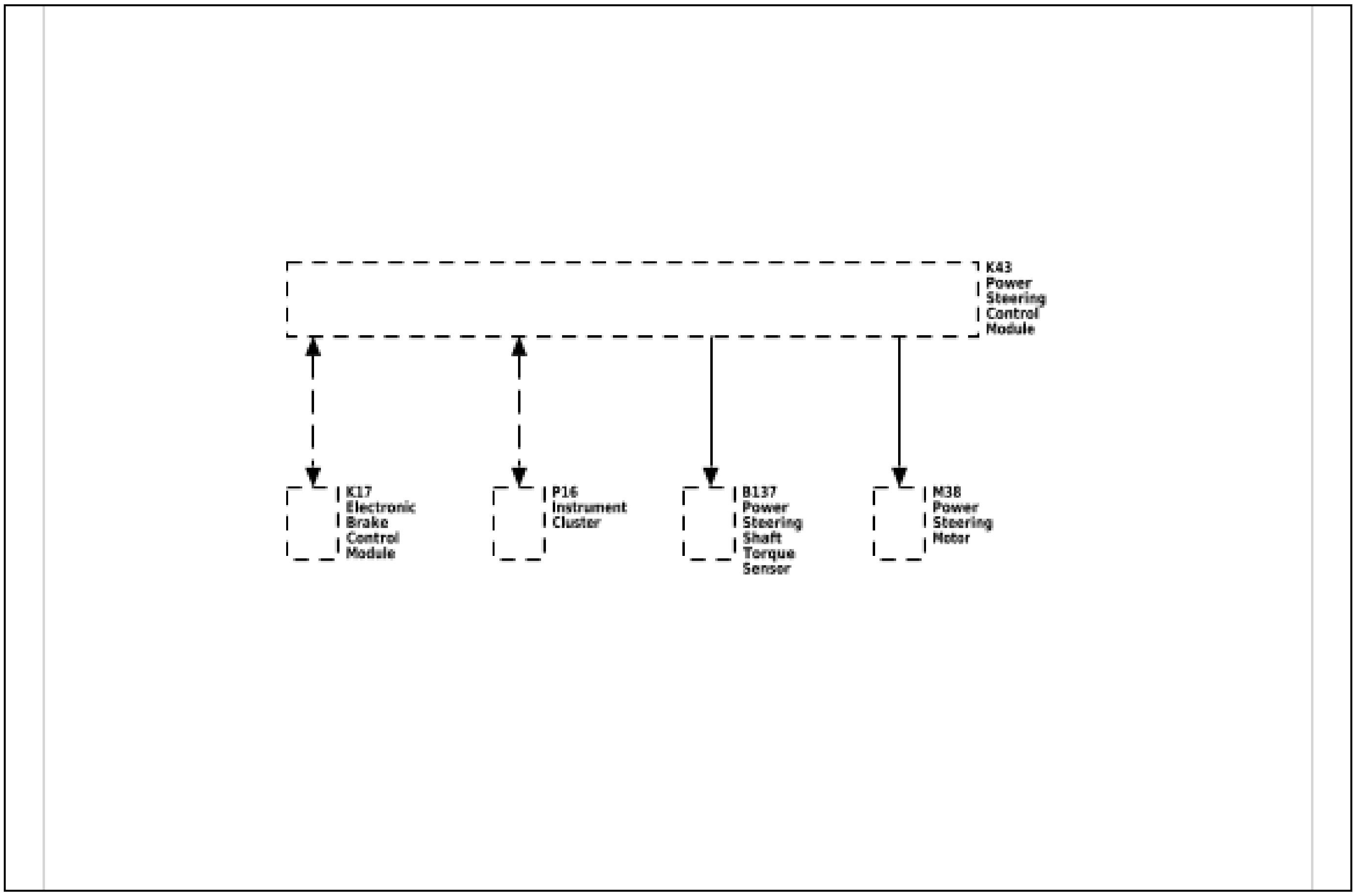
Power Steering Schematics (Variable Effort Steering (NV8))


B+
X50A Engine Wiring Harness Junction Block
F61UA 5A
X4 C1
5740 RD/WH
X1 5
B+
Data Communication Schematics
4987 BU
4986 WH
4987 BU
4986 WH
1
2
7
8
K43 Power Steering Control Module
L
5V
R
X1 11
X2 4
2
5
1
X3 1
2
3128 WH
3130 RD
3129 GN
8023 BK
4
2
3
5
B302 Steering Gear Pressure Sensor
P U
BK
M72 Variable Power Steering Solenoid Valve
BK
1151 BK/WH
G402
6846440

Description and Operation

Power Steering System Description and Operation (Electric Power Steering)

Electric Power Steering Block Diagram



3603736

Serial Data

Serial Data

Hard-Wired

Hard-Wired

K43 Power Steering Control Module

K17 Electronic Brake Control Module

P16 Instrument Cluster

B137 Power Steering Shaft Torque Sensor

M38 Power Steering Motor

The belt driven electronic power steering system consists of the following components:

- The integrated electromechanical power steering unit, containing the power steering control module, its sensors, the power steering motor, a belt drive and a ball nut mechanism.
- The steering gear (rack and pinion)

The power steering control module is part of the power steering assist motor assembly and is replaceable as a complete unit independent of the steering gear assembly. The torque sensor is integrated with the steering gear pinion and is serviced as part of the steering gear.

The belt driven electric power steering system reduces the amount of effort needed to steer the vehicle utilizing the power steering control module to control the power steering motor to maneuver the steering gear. The power steering control module also uses a combination of the torque sensor, motor rotational sensor, battery voltage circuit and serial data circuit to perform the system functions. At low speeds more assist is provided for easy turning during parking maneuvers. At higher speeds less assist is provided for improved road feel and directional stability.

The power steering control module continuously monitors the digital torque sensor's torque and index current signals. As the steering wheel is turned and torque is applied to the steering shaft, the steering input and output shafts are monitored via the torque signal circuit and then processed by the power steering control module to calculate the steering torque. The voltage signals of the motor position sensor and the digital torque sensor's index current signal are both processed by the power steering control module to detect and calculate the steering wheel angle.

The power steering control module responds to the change in the digital torque sensor signals as well as the motor rotational sensor's voltage signals by commanding current to the power steering motor. The power steering control module controls the motor drive circuit to drive the alternating current motor. The power steering control module and motor assembly is attached to the base of the steering gear housing and applies power assist directly to the rack with a belt drive and a ball nut mechanism to maneuver the rack laterally depending on the direction the steering wheel is turned.

The power steering control module has advanced software features referred to as Active Pull Compensation and Smooth Road Shake Compensation.

Active Pull Compensation constantly measures steering wheel torque being applied by the driver to maintain the vehicle’s path. When the software detects extra effort being used, the steering assist motor adds torque in the proper direction to prevent the driver from having to make corrections to keep the vehicle on course. The torque assistance reduces driver fatigue and effort and makes steering easier. The software automatically resets itself to compensate for changing road conditions or the vehicle turning on curves. This software feature will compensate for a specific range of lead/pull up to its maximum limit within a set of parameters. The feature can be disabled during diagnostics for appropriate root cause of a complaint vehicle.

Smooth Road Shake Compensation reduces steering wheel rotational vibration caused by an imbalance from the front tire/wheel assemblies. The rotational vibration transmitted to the steering wheel is referred to as Smooth Road Shake and is a phenomenon that occurs only at highway speeds and on smooth roads. The power steering control module employs active controls to sense and reduce the periodic torque component applied to the steering wheel caused by the wheel imbalance force. This software feature will compensate for a specific range of imbalance. If the imbalance is above a certain level, the power steering control module will disable the smooth road shake compensation software feature and set a DTC C044B to indicate that it has been disabled.

The power steering control module has the ability to calculate an internal system temperature to protect the power steering system from potential damage. To reduce a high system temperature, the power steering control module will reduce the amount of current commanded to the power steering motor, which reduces the amount of steering assist and will set DTC C0176.

The power steering control module has the ability to detect malfunctions within the electric power steering system. Any malfunction detected that disables steering assist will cause the SERVICE POWER STEERING or STEERING ASSIST IS REDUCED DRIVE WITH CARE message to be displayed on the driver information center.

Power Steering System Description and Operation (Hydraulic Power Steering)

The hydraulic power steering pump is a constant displacement vane-type pump that provides hydraulic pressure and flow for the power steering gear. The hydraulic power steering pump is belt-driven.

The power steering fluid reservoir holds the power steering fluid and may be integral with the power steering pump or remotely located. The following locations are typical locations for the remote reservoir:

- Mounted to the front of the dash panel
- Mounted to the inner fender
- Mounted to a bracket on the engine

The 2 basic types of power steering gears are listed below:

- A recirculating ball system
- A rack and pinion system

In the recirculating ball system, a worm gear converts steering wheel movement to movement of a sector shaft. A pitman arm attached to the bottom of the sector shaft actually moves one tie rod and an intermediate rod move the other tie rod.

In the rack and pinion system, the rack and the pinion are the 2 components that convert steering wheel rotation to lateral movement. The steering shaft is attached to the pinion in the steering gear. The pinion rotates with the steering wheel. Gear teeth on the pinion mesh with the gear teeth on the rack. The rotating pinion moves the rack from side to side. The lateral action of the rack pushes and pulls the tie rods in order to change the direction of the vehicle's front wheels.

The power steering pressure hose connects the power steering pump union fitting to the power steering gear and allows pressurized power steering fluid to flow from the pump to the gear.

The power steering return hose returns fluid from the power steering gear back to the power steering fluid reservoir. The power steering return line may contain an integral fin-type or line-type power steering fluid cooler.

In a typical power steering system, a pump generates hydraulic pressure, causing fluid to flow, via the pressure hose, to the steering gear valve assembly. The steering gear valve assembly regulates the incoming fluid to the right and left chambers in order to assist in right and left turns.

Turning the steering wheel activates the valve assembly, which applies greater fluid pressure and flow to 1 side of the steering gear piston, and lower pressure and flow to the other side of the piston. The pressure assists the movement of the gear piston. Tie rods transfer this force to the front wheels, which turn the vehicle right or left.

Power Steering System Description and Operation (Active Hydraulic Assist (NV8))

The Active Hydraulic Assist (AHA) system is an updated recirculating ball hydraulic power steering system that allows for some of the performance benefits of electric power steering such as variable effort steering, active return to center, active damping, and lead/pull compensation.

The original hydraulic system was retrofitted with the AHA Module, a pressure sensor, and an electric coil (electromechanical valve).

The pressure sensor is one unit with two separate detection bodies located in the left and right chambers of the steering gear. As the driver turns the steering wheel, the pressure increases on one side and decreases on the other. These pressure changes are sent to the AHA module which then decides which way to direct the hydraulic pressure.

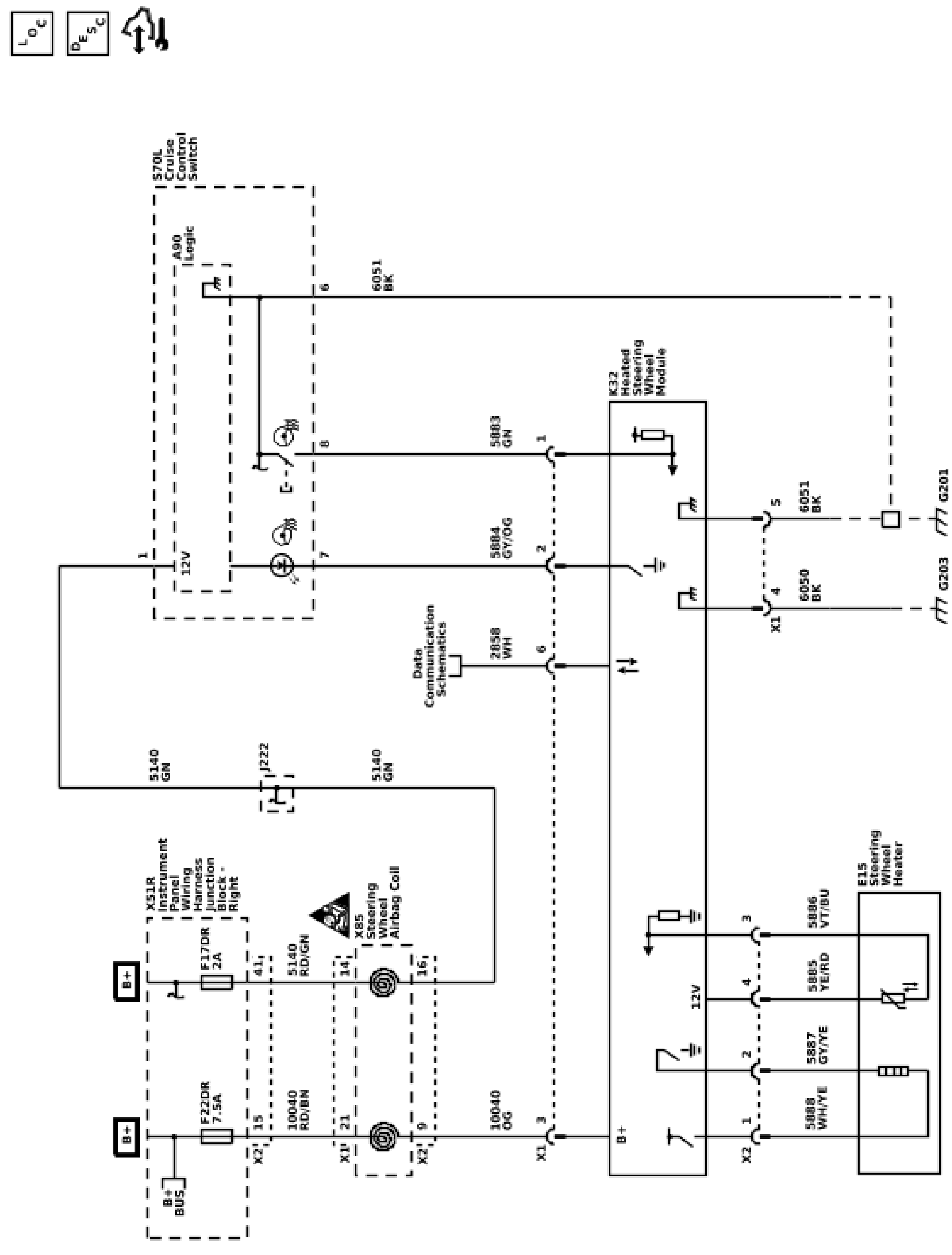
The electromechanical control of the pressure valve allows for the additional functions in the power steering system.

The TOW/HAUL feature will change the amount of assist provided. The power steering system will still provide more assist at lower speeds and less assist at higher speeds with TOW/HAUL enabled. However, with TOW/HAUL enabled, the amount of assist provided at higher speeds will be less than what it provided with TOW/HAUL disabled. This is to account for the front axle mass being lower during towing.

Steering Wheel and Column

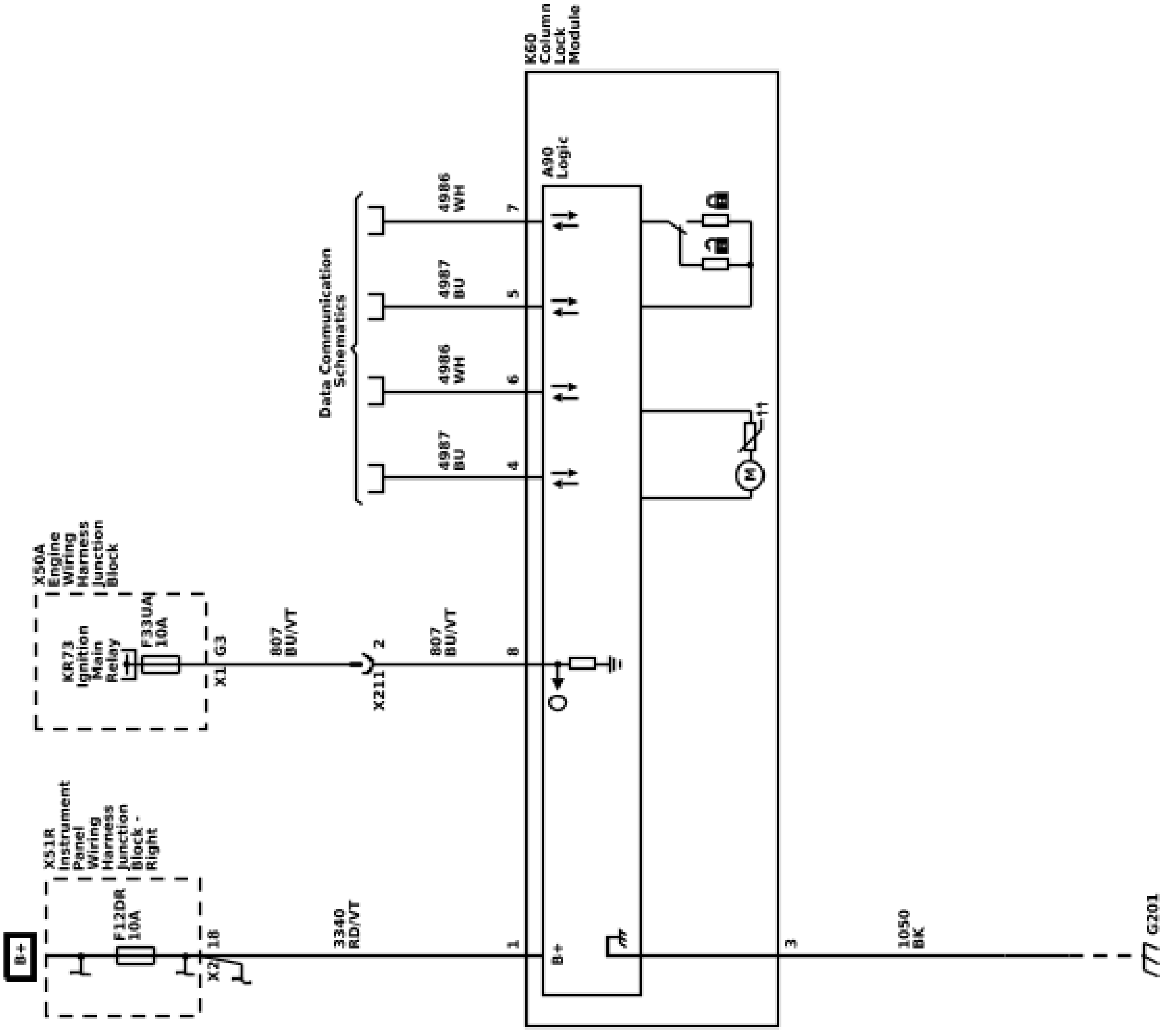
Schematic and Routing Diagrams

Steering Wheel Schematics (Heated Steering Wheel (KI3))


6846441
LOC
DESC
S70L Cruise Control Switch
A90 Logic
12V
1
6
7
8
6051 BK
5883 GN
5884 GY/OG
2858 WH
Data Communication Schematics
K32 Heated Steering Wheel Module
1
2
6
5
4
X1
6051 BK
6050 BK
G201
G203
5140 GN
J222
5140 GN
X51R Instrument Panel Wiring Harness Junction Block - Right
B+
F17DR 2A
F22DR 7.5A
B+ BUS
41
15
X2
5140 RD/GN
10040 RD/BN
X85 Steering Wheel Airbag Coil
14
21
X1
16
9
X2
10040 OG
3
X1
B+
12V
3
4
2
1
X2
5886 VT/BU
5885 YE/RD
5887 GY/YE
5888 WH/YE
E15 Steering Wheel Heater

Column Lock Schematics (Steering Column Lock (BTM))

6846442


B+
X51R Instrument Panel Wiring Harness Junction Block - Right
F12DR 10A
X2 18
3340 RD/VT
1
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F33UA 10A
X1 G3
807 BU/VT
X211 2
807 BU/VT
8
Data Communication Schematics
4987 BU
4
4986 WH
6
4987 BU
5
4986 WH
7
K60 Column Lock Module
A90 Logic
B+
M
3
1050 BK
G201

Description and Operation

Steering Wheel and Column Description and Operation

Column Lock (if equipped)

The Column Lock Module (CLM) controls the steering wheel theft deterrent lock function, which allows the column to be electronically locked. When a valid key is used to start the vehicle, the BCM recognizes this and will send the encrypted password to the CLM. The CLM will compare its own stored password to the encrypted password sent by the BCM. If the data matches, the steering column will be unlocked.

In order for the steering column to be locked the CLM has to see 3 inputs.

1. The BCM power mode is OFF.
2. The vehicle is stationary based on zero speed reported from all ABS wheel speed sensors.
3. The driver door is reported open by the BCM.

When the CLM receives these inputs, the steering column will be locked.

The CLM monitors the column lock system and will set DTC codes when the module detects malfunctions within the system. When a malfunction occurs the driver information center (DIC) will display the Service Column Lock Now message indicating DTC codes are set within the CLM. The immobilizer system will prevent vehicle starting if there is a fault or no communication with the CLM.

Tilt/Telescoping Description (if equipped)

The steering column has a tilt/telescoping control system that consists of an electronic control module capable of LIN message communication, a steering column power assembly with positioning actuators and sensors, and a steering column control switch.

Column Position Module has two versions of operation:

1. N38 – Power Steering Column-Tilt/Telescope, and A45 – Memory Seats

   The column position module will wake up either by the LIN bus or by the tilt/telescope steering column switch. The memory seat module is the master and column position module is the slave. All DTCs and the data from column position module are reported through the LIN bus and stored in the memory seat module.

2. N38 – Power Steering Column-Tilt/Telescope Only

   The column position module will wake up with the tilt/telescope steering column switch. No DTCs or data is available. Vehicle symptoms will cause the customer to bring the vehicle in for service.

Tilt/Telescoping Switch Operation

The tilt/telescope steering column has a four-position switch. The switch may be used to adjust the position of the steering wheel in or out which is telescope and up or down which is tilt. The position of the column may be changed as follows:

- Press the switch up to tilt the column up.
- Press the switch down to tilt the column down.
- Press the switch forward and the column moves toward the front of the vehicle.
- Press the switch rearward and the column moves toward the rear of the vehicle.

Actuators

Both the tilt and telescoping actuators are reversible. For example, the tilt actuator moves the column both up and down. When the column position module receives an input to move the column up, the column position module supplies battery positive voltage and ground to the tilt actuator in order to move the column up. When the column position module receives a column down input, the column position module supplies battery positive voltage and ground to the same actuator, but with reverse polarity. When the voltage polarity is reversed, the actuator runs in the opposite direction and moves the column down.

Position Sensors with A45 Memory Seats

Two position sensors are Hall Effect sensors and are used by the column position module. The column position module provides a 5 V reference voltage and a ground to both the tilt and telescoping position sensors. The sensor feedback circuit voltage varies from 0–5 V. Each sensor is part of the actuator assembly. When the actuator rotates, the voltage of the sensor varies on the scan tool. The column position module monitors the feedback voltage to determine the column position.

Without the A45 Memory Seat option, scan tool data is not available.

Tilt/Telescoping Memory with A45 Memory Seats
Memory settings and the personalization of steering wheel positions are available with the tilt/telescoping steering column only with the A45 Memory Seat option. The data stored consists of entry positions and exit positions. The entry position is the position that the steering column moves in when the ignition is turned ON. The exit position is the direction that the steering column moves in when the ignition is turned OFF and the driver's door is opened. The memory seat module stores memory positions and commands column position module to move actuators to specific positions through a LIN message.

An initial memory setting is set in the memory seat module at the assembly plant. This setting may be changed by the customer at any time.

Without the A45 Memory Seat option, memory settings, personalization, and the entry and exit function is not available.

Driver Safety

The steering wheel and column has safety features to protect the driver. The following components may be mounted on or near the steering column:

Energy-Absorbing Steering Column: The energy-absorbing steering column compresses in the event of a front-end collision, which reduces the chance of injury to the driver. The energy-absorbing feature, collapsible steering shaft, and break away mounting features help reduce the injury in the event of an accident.

Heated Steering Wheel (if equipped)

The heated steering wheel system consists of a heated steering wheel, a heated steering wheel switch, and a K32 Heated Steering Wheel Module. The heated steering wheel includes non-serviceable heating elements and a temperature sensor. The heating elements and sensor are located in the left and right sides of the rim of the steering wheel. The heated steering wheel switch is located in the left steering wheel control switch assembly. The steering wheel heat control module is located at the bottom of the steering wheel center hub. When the switch is pressed, the switch signal circuit is grounded and the heat module turns the heated steering wheel on. The system then remains on until the customer turns it off. The wheels normal operating temperature is 32°C (89.6°F). The wheel takes approximately 3 to 4 minutes to reach the normal operating temperature. The wheel will take longer to heat up if the vehicle temperature is below -21°C (-5.8°F). The built-in temperature sensor provides input to the controller to limit the temperature to the normal operating temperature. The wheel will not operate if the vehicle temperature is at or above 32°C (89.6°F).

The heated steering wheel control module is on the LIN bus. This allows the heated steering wheel to be activated during remote vehicle start.

For vehicles equipped with UKL, the K180S Driver Monitoring System Module controls the steering wheel heater, the steering wheel LED display and the steering wheel touch sensors. The K180S Driver Monitoring System Module - Steering Wheel is integral to the steering wheel and cannot be replaced by itself. The K180S Driver Monitoring System Module - Steering Wheel is also a LIN device to the K124 Image Processing Module.

Section 13

Suspension

Tire Pressure Monitoring 13-2

Schematic and Routing Diagrams 13-2

Tire Pressure Monitoring System Schematics 13-3

Description and Operation 13-4

Tire Pressure Monitor Description and Operation (-DZW) 13-4

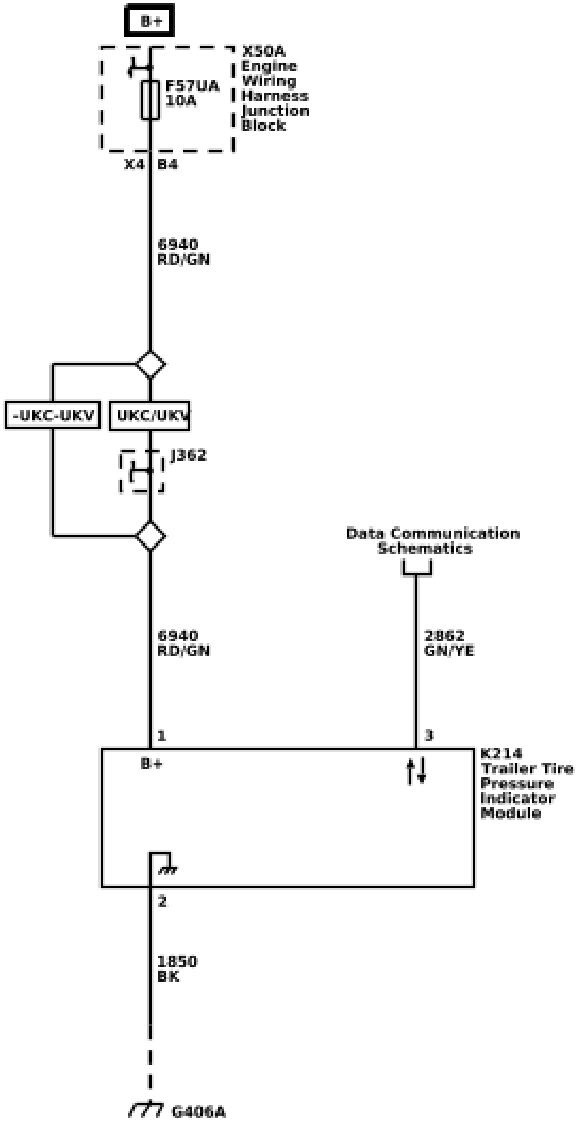
Tire Pressure Monitor Description and Operation (DZW) 13-5

Suspension

Tire Pressure Monitoring

Schematic and Routing Diagrams

Tire Pressure Monitoring System Schematics (Trailer Tire Pressure (UET))


B+
X50A Engine Wiring Harness Junction Block
F57UA 10A
X4 B4
6940 RD/GN
-UKC-UKV
UKC/UKV
J362
Data Communication Schematics
6940 RD/GN
2862 GN/YE
1
3
B+
K214 Trailer Tire Pressure Indicator Module
2
1850 BK
G406A

6846443

Description and Operation

Tire Pressure Monitor Description and Operation (-DZW)

Special Tools

EL-52545
Tire Pressure Monitor Sensor and RF Diagnostic Tool

For equivalent regional tools, refer to [Link target (target-id 59410-) not found] .

Tire Pressure Monitoring System Operation

The tire pressure monitor system warns the driver when a significant loss of tire pressure occurs in any of the equipped tires. It allows the driver to display the individual tire pressures and their locations on the driver information center.

The system uses the body control module (BCM), driver information center, instrument cluster, remote function actuator module, and a radio frequency transmitting pressure sensor in each tire assembly. Each sensor has an internal power supply.

Tire Fill Alert (TFA) (If Equipped) feature provides visual and audible alerts (light flashes and horn chirps) to drivers to assist in inflating an underinflated tire to the recommended tire pressure without the need to check a gauge or the instrument panel. TFA only functions once the tire pressure is low enough to trigger the telltale on the dashboard. When the driver starts filling the underinflated tire, the corner lamp nearest to that tire will begin to flash. When the recommended pressure is reached, the horn sounds once and the turn signal lamps will stop flashing and briefly turn solid. If the tire is overinflated by more than 35 kPa (5 psi), the horn will sound multiple times and the turn signal lamp will continue to flash for several seconds after filling stops. To release and correct the pressure, while the turn signal lamp is still flashing, briefly press the center of the valve stem. When the recommended pressure is reached, the horn sounds once.

Software Auto Learn (SAL) (If Equipped) is achieved by correlating information from the sensor with information from the ABS system to make a location decision. Factors such as rolling radius, steering angle etc. cause each vehicle wheel to rotate at a unique speed and difference in tire speeds helps software auto learn feature to assign sensor IDs to the correct locations. If a new sensor has been installed or tire rotated, the vehicle must be stationary for about 20 minutes before the system can start the process of calculating correct sensor locations. For this to happen, the vehicle will need to be driven at speed greater than 20 km/h (12 mph) for about 10 min.

When the vehicle is stationary, the sensors internal shock sensor is inactive which puts the sensors into a Stationary state. In this state the sensors sample tire pressure once every 30 sec and do not transmit at all if the tire pressure does not change. As vehicle speed increases, the shock sensor pulses every wheel rotation, which puts the sensor into Rolling mode. The remote function actuator module receives and then sends the tire pressure and temperature data to the body control module (BCM). The BCM translates the data contained in the tire pressure sensor radio frequency transmissions into sensor presence, sensor mode, and tire pressure. Once vehicle speed is greater than 40 km/h (25 MPH), the sensors begin to transmit once a minute keeping the pressure data up to date.

Each sensor has its own unique identification (ID) code which it transmits as part of each RF message and must be learned into the BCM memory. Once all 4 ID's have been learned and vehicle speed is greater than 40 km/h (25 mph), the BCM continuously compares ID's and pressure data in the received transmissions to the learned ID's and pressures to determine if all 4 sensors are present and if one or more tires are low. If the BCM detects a low tire pressure condition, or a malfunction in the system, it will send a serial data message to the instrument cluster requesting the appropriate tire pressure monitor indicator illumination and also to display the appropriate data message on the driver information center, if equipped.

The sensors continuously compare their last pressure sample to their current pressure sample and will transmit in Alert mode if a 8.3 kPa (1.2 PSI) change in tire pressure has been detected in either a Stationary or Rolling state. When the tire pressure system detects a significant loss, or gain of tire pressure, the tire pressure monitor indicator icon is continuously illuminated on the instrument cluster and if equipped, a check tire pressure type message is displayed on the driver information center.

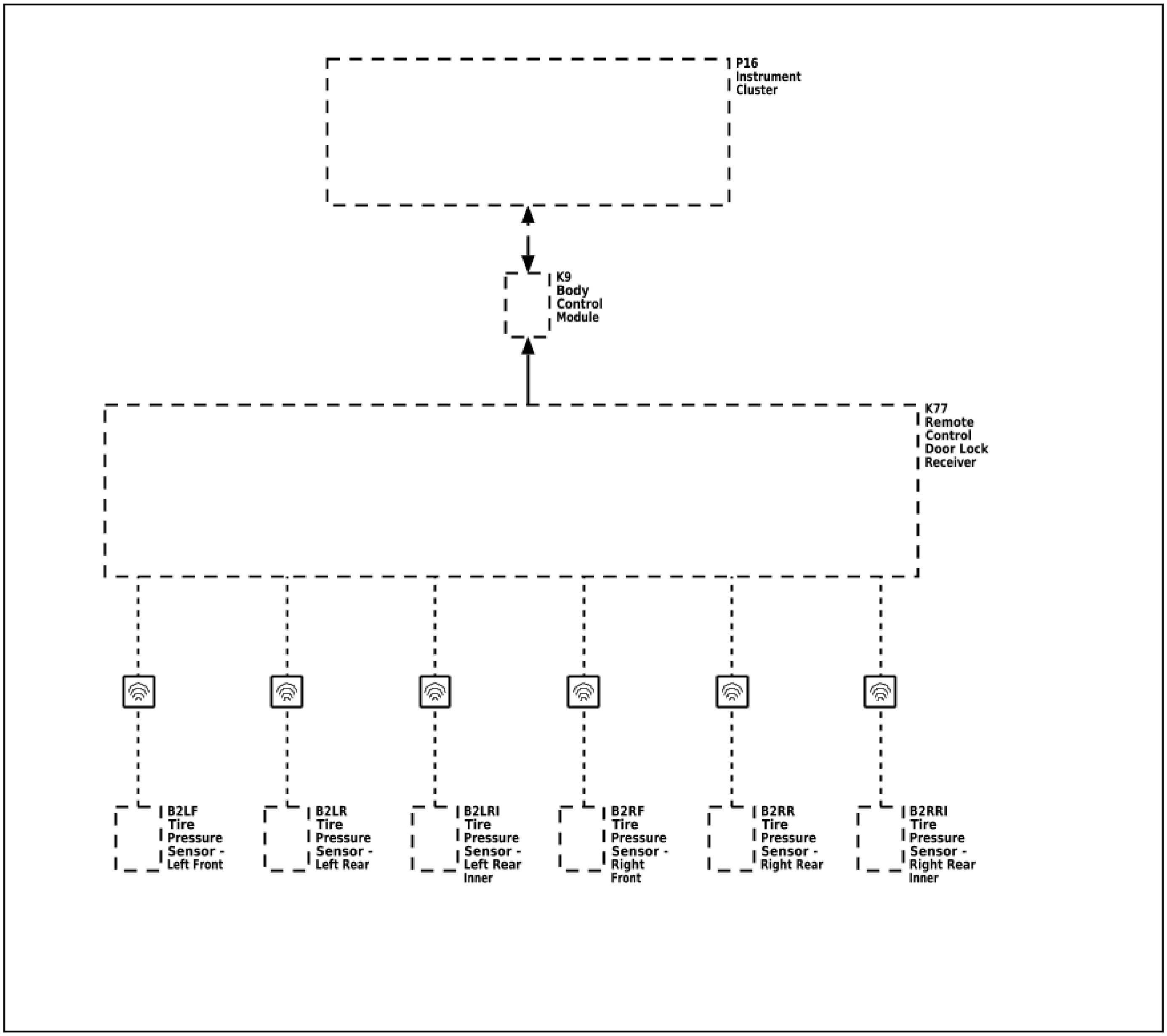
Both the indicator icon and driver information center message can be cleared by adjusting the tire pressures to the recommended kPa/PSI.

If power is disconnected from the BCM or if the vehicle battery is disconnected each tire pressure sensor ID is retained but all of the tire pressure information is lost. Under these circumstances the BCM cannot assume that the tire pressures were maintained over an unknown period of time. Cars equipped with the driver information center will display dashes and the scan tool will indicate a default tire pressure value of 220 kPa (32 PSI) for each tire. To reactivate the sensors, the vehicle must be driven above 40 km/h (25 MPH) for at least 2 min. When the sensors are activated, the driver information center displays the current tire pressures. The EL-52545 tire pressure monitor sensor and RF diagnostic tool may also be used to activate the sensors as well.

Tire Pressure Monitoring Block Diagram

The BCM has the ability to detect malfunctions within the tire pressure monitor system. In the event a DTC is set, the tire pressure monitor indicator icon on the instrument cluster will flash for approximately 1 min. and then remain illuminated for the remainder of the key cycle. After a key cycle and the instrument cluster bulb check has been completed the indicator will again flash for 1 min. and then remain illuminated if the DTC persists. Any malfunction detected will cause the driver information center to display a service tire monitor system type message.

Tire Pressure Monitor Description and Operation (DZW)


P16 Instrument Cluster
K9 Body Control Module
K77 Remote Control Door Lock Receiver
B2LF Tire Pressure Sensor - Left Front
B2LR Tire Pressure Sensor - Left Rear
B2LRI Tire Pressure Sensor - Left Rear Inner
B2RF Tire Pressure Sensor - Right Front
B2RR Tire Pressure Sensor - Right Rear
B2RRI Tire Pressure Sensor - Right Rear Inner

5439357

Serial Data

Hard-Wired

Wireless
Wireless
Wireless
Wireless
Wireless
Wireless
P16 Instrument Cluster
K9 Body Control Module
K77 Remote Control Door Lock Receiver
B2LF Tire Pressure Sensor - Left Front
B2RF Tire Pressure Sensor - Right Front
Tire Pressure Sensor - Left Rear Inner
Tire Pressure Sensor - Right Rear Inner
B2LR Tire Pressure Sensor - Left Rear
B2RR Tire Pressure Sensor - Right Rear

Special Tools

EL-52545
Tire Pressure Monitor Sensor and RF Diagnostic Tool

For equivalent regional tools, refer to [Link target (target-id 59410-) not found] .

Tire Pressure Monitoring System Operation

The tire pressure monitor system warns the driver when a significant loss of tire pressure occurs in any of the equipped tires. It allows the driver to display the individual tire pressures and their locations on the driver information center.

The system uses the body control module (BCM), driver information center, instrument cluster, remote function actuator module, and a radio frequency transmitting pressure sensor in each tire assembly. Each sensor has an internal power supply.

Tire Fill Alert (TFA) (If Equipped) feature provides visual and audible alerts (light flashes and horn chirps) to drivers to assist in inflating an underinflated tire to the recommended tire pressure without the need to check a gauge or the instrument panel. TFA only functions once the tire pressure is low enough to trigger the telltale on the dashboard. When the driver starts filling the underinflated tire, the corner lamp nearest to that tire will begin to flash. When the recommended pressure is reached, the horn sounds once and the turn signal lamps will stop flashing and briefly turn solid. If the tire is overinflated by more than 35 kPa (5 psi), the horn will sound multiple times and the turn signal lamp will continue to flash for several seconds after filling stops. To release and correct the pressure, while the turn signal lamp is still flashing, briefly press the center of the valve stem. When the recommended pressure is reached, the horn sounds once.

Software Auto-location (SAL) (If Equipped) is achieved by correlating information from the sensor with information from the ABS system to make a location decision. Factors such as rolling radius, steering angle etc. cause each vehicle wheel to rotate at a unique speed and difference in tire speeds helps software auto learn feature to assign sensor IDs to the correct locations. If a new sensor has been installed or tire rotated, the vehicle must be stationary for about 20 minutes before the system can start the process of calculating correct sensor locations. For this to happen, the vehicle will need to be driven at speed greater than 20 km/h (12 mph) for about 10 min.

When the vehicle is stationary, the sensors internal shock sensor is inactive which puts the sensors into a Stationary state. In this state the sensors sample tire pressure once every 30 sec and do not transmit at all if the tire pressure does not change. As vehicle speed increases, the shock sensor pulses every wheel rotation, which puts the sensor into Rolling mode. The remote function actuator module receives and then sends the tire pressure and temperature data to the body control module (BCM). The BCM translates the data contained in the tire pressure sensor radio frequency transmissions into sensor presence, sensor mode, and tire pressure. Once vehicle speed is greater than 40 km/h (25 MPH), the sensors begin to transmit once a minute keeping the pressure data up to date.

Each sensor has its own unique identification (ID) code which it transmits as part of each RF message and must be learned into the BCM memory. Once all 4 ID's have been learned and vehicle speed is greater than 40 km/h (25 mph), the BCM continuously compares ID's and pressure data in the received transmissions to the learned ID's and pressures to determine if all 4 sensors are present and if one or more tires are low. If the BCM detects a low tire pressure condition, or a malfunction in the system, it will send a serial data message to the instrument cluster requesting the appropriate tire pressure monitor indicator illumination and also to display the appropriate data message on the driver information center, if equipped.

The sensors continuously compare their last pressure sample to their current pressure sample and will transmit in Alert mode if a 8.3 kPa (1.2 PSI) change in tire pressure has been detected in either a Stationary or Rolling state. When the tire pressure system detects a significant loss, or gain of tire pressure, the tire pressure monitor indicator icon is continuously illuminated on the instrument cluster and if equipped, a check tire pressure type message is displayed on the driver information center.

Both the indicator icon and driver information center message can be cleared by adjusting the tire pressures to the recommended kPa/PSI.

If power is disconnected from the BCM or if the vehicle battery is disconnected each tire pressure sensor ID is retained but all of the tire pressure information is lost. Under these circumstances the BCM cannot assume that the tire pressures were maintained over an unknown period of time. Cars equipped with the driver information center will display dashes and the scan tool will indicate a default tire pressure value of 220 kPa (32 PSI) for each tire. To reactivate the sensors, the vehicle must be driven above 40 km/h (25 MPH) for at least 2 min. When the sensors are activated, the driver information center displays the current tire pressures. The EL-52545 tire pressure monitor sensor and RF diagnostic tool may also be used to activate the sensors as well.

The BCM has the ability to detect malfunctions within the tire pressure monitor system. In the event a DTC is set, the tire pressure monitor indicator icon on the instrument cluster will flash for approximately 1 min. and then remain illuminated for the remainder of the key cycle. After a key cycle and the instrument cluster bulb check has been completed the indicator will again flash for 1 min. and then remain illuminated if the DTC persists. Any malfunction detected will cause the driver information center to display a service tire monitor system type message.

Section 14

Transmission

Power Take-Off 14-2
  Schematic and Routing Diagrams 14-2
    Power Take-Off (PTO) Schematics 14-3
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    Power Take-Off (PTO) Description and Operation 14-5
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    Transfer Case Control Schematics 14-10
  Description and Operation 14-13
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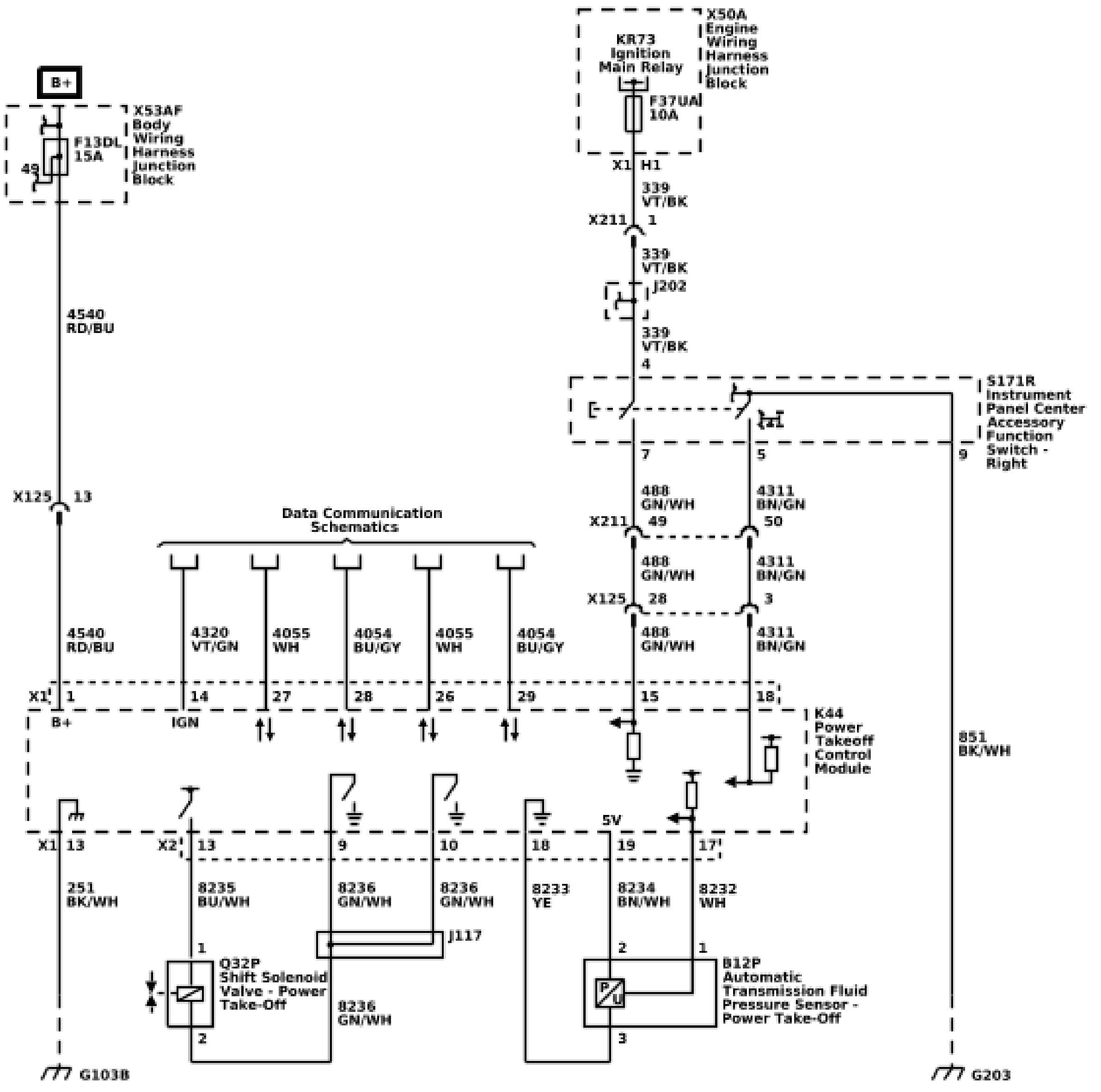
    Transfer Case Control Schematics 14-24
  Description and Operation 14-27
    Transfer Case Description and Operation 14-27

Transmission

Power Take-Off

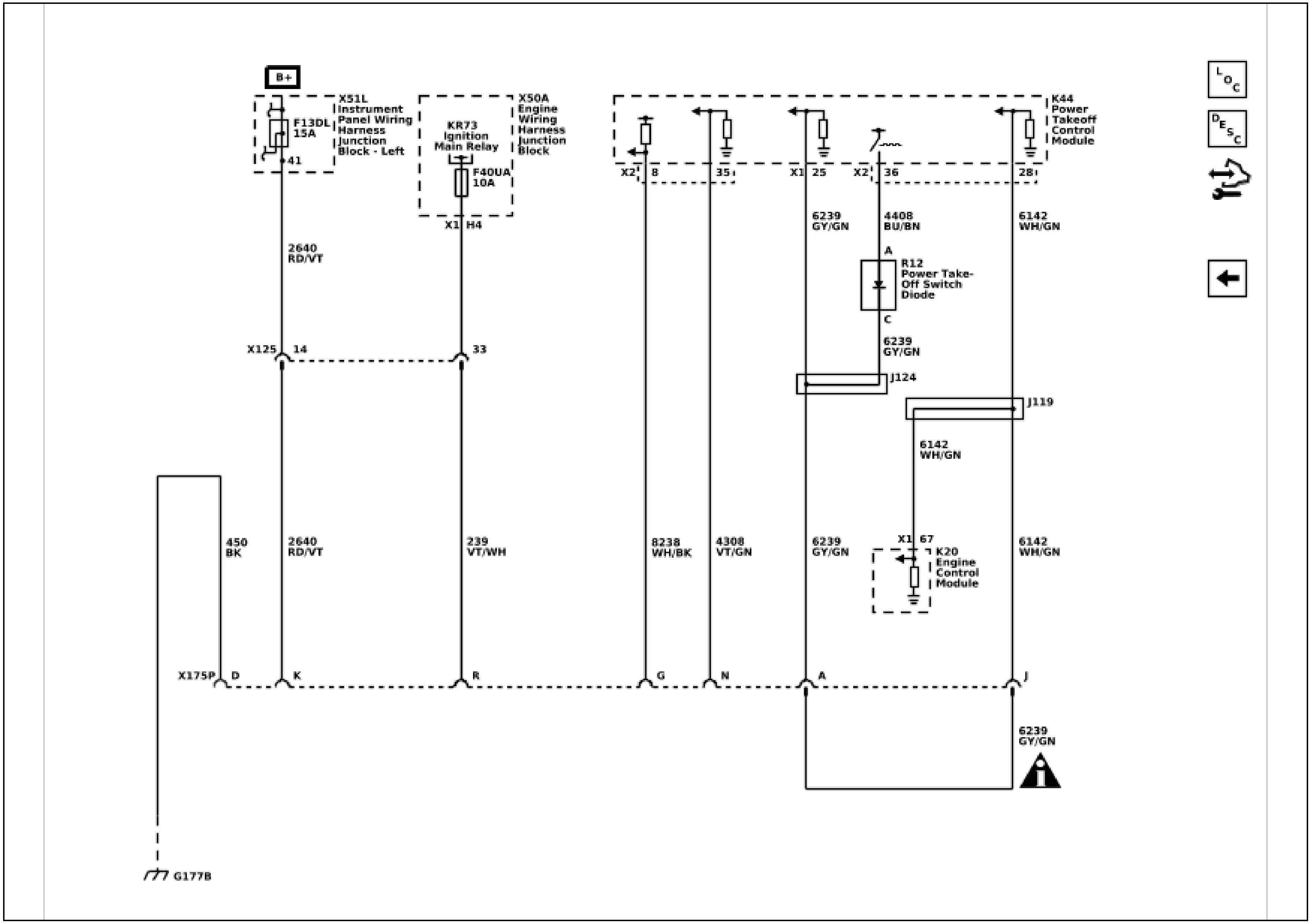
Schematic and Routing Diagrams

Power Take-Off (PTO) Schematics (Power, Ground, Serial Data and Enable (PTO))


B+
X53AF Body Wiring Harness Junction Block
F13DL 15A
49
4540 RD/BU
X125 13
4540 RD/BU
X1 1
B+
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F37UA 10A
X1 H1
339 VT/BK
X211 1
339 VT/BK
J202
339 VT/BK
4
S171R Instrument Panel Center Accessory Function Switch - Right
7
5
9
488 GN/WH
4311 BN/GN
X211 49
50
488 GN/WH
4311 BN/GN
X125 28
3
488 GN/WH
4311 BN/GN
Data Communication Schematics
4320 VT/GN
4055 WH
4054 BU/GY
4055 WH
4054 BU/GY
14
27
28
26
29
15
18
IGN
K44 Power Takeoff Control Module
851 BK/WH
5V
X1 13
X2 13
9
10
18
19
17
251 BK/WH
8235 BU/WH
8236 GN/WH
8236 GN/WH
8233 YE
8234 BN/WH
8232 WH
J117
1
Q32P Shift Solenoid Valve - Power Take-Off
2
8236 GN/WH
2
1
B12P Automatic Transmission Fluid Pressure Sensor - Power Take-Off
3
G103B
G203

6846448

Power Take-Off (PTO) Schematics (Provisional Connector (PTO))


B+
X51L Instrument Panel Wiring Harness Junction Block - Left
F13DL 15A
41
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F40UA 10A
X1 H4
K44 Power Takeoff Control Module
X2 8
35
X1 25
X2 36
28
2640 RD/VT
6239 GY/GN
4408 BU/BN
6142 WH/GN
A
R12 Power Take-Off Switch Diode
C
6239 GY/GN
J124
J119
6142 WH/GN
X125 14
33
450 BK
2640 RD/VT
239 VT/WH
8238 WH/BK
4308 VT/GN
6239 GY/GN
X1 67
K20 Engine Control Module
6142 WH/GN
X175P D
K
R
G
N
A
J
6239 GY/GN
G177B
6846449

Description and Operation

Power Take-Off (PTO) Description and Operation

Power Take-Off System

The Power Take-Of (PTO) is a General Motors (GM) Upfitter integrated system that creates an auxiliary power source for running add-on equipment, such as salt spreaders, snow plows, winches, and lift buckets. It controls engine speed to values higher than normal base idle, PTO integral clutch engagement, and remote starting and shutdown of the engine.

For specific information on how to set up and operate the Power Take Off system refer to the vehicle’s owners manual and the GM Upfitter website.

PTO Components

The Original Equipment Manufacturer (OEM) PTO components consist of:

- The transmission (internal) PTO gear which rotates with the torque converter
- The In-cab PTO switch and cruise control SET and RES switches
- The PTO telltale indicator
- The Driver Information Center (DIC)
- The Radio and Navigation Screen (HMI)
- The Power Take-Off Module
- The PTO Unit
- The On/Off Solenoid
- The Pressure Sensor
- The Remote PTO Upfitter connector X176

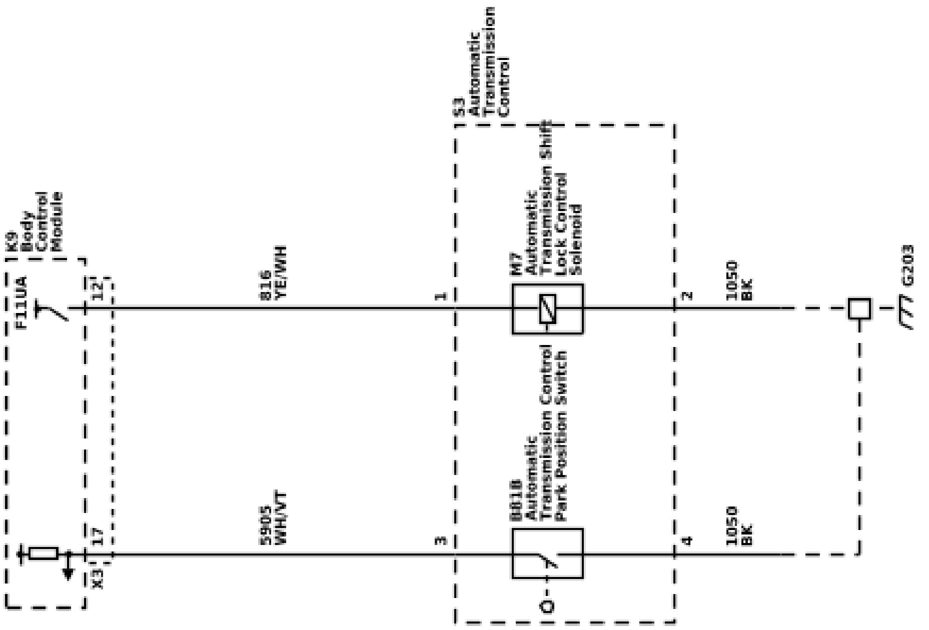
Note: The interface connector X176 is located underneath the cab, near the left frame rail and comes with a cap which is the mating half to the truck harness connector. This is the connector the Upfitter will use to wire in necessary external electrical components such as external switches to control the PTO from outside the cab.

Shift Lock Control

Schematic and Routing Diagrams

6846450

Shift Lock Control Schematics (Shift Lock Control)


K9
Body
Control
Module
F11UA
12
X3
17
816
YE/WH
5905
WH/VT
S3
Automatic
Transmission
Control
1
3
M7
Automatic
Transmission Shift
Lock Control
Solenoid
B818
Automatic
Transmission Control
Park Position Switch
2
4
1050
BK
1050
BK
G203

Description and Operation

Automatic Transmission Shift Lock Control Description and Operation

The Automatic Transmission Shift Lock Control System is a safety device that prevents an inadvertent shift out of PARK when the engine is running. The driver must press the brake pedal before moving the shift lever out of the PARK position. The system consists of the following components:

- The Automatic Transmission Shift Lock Solenoid (serviced as the S3 Automatic Transmission Shift Lock Actuator)
- The Body Control Module (BCM)
- The Engine Control Module (ECM)

The BCM controls the voltage to the shift lock control solenoid though the shift lock control solenoid controlled voltage circuit. The following conditions must be met before the BCM will supply voltage to the shift lock control solenoid:

- The ignition is in the ON position.
- The ECM sends an input via GMLAN serial data to the BCM when the Transmission Control Module (TCM) indicates the transmission is in the PARK position.
- The BCM receives a brake applied input from the stop lamp switch.

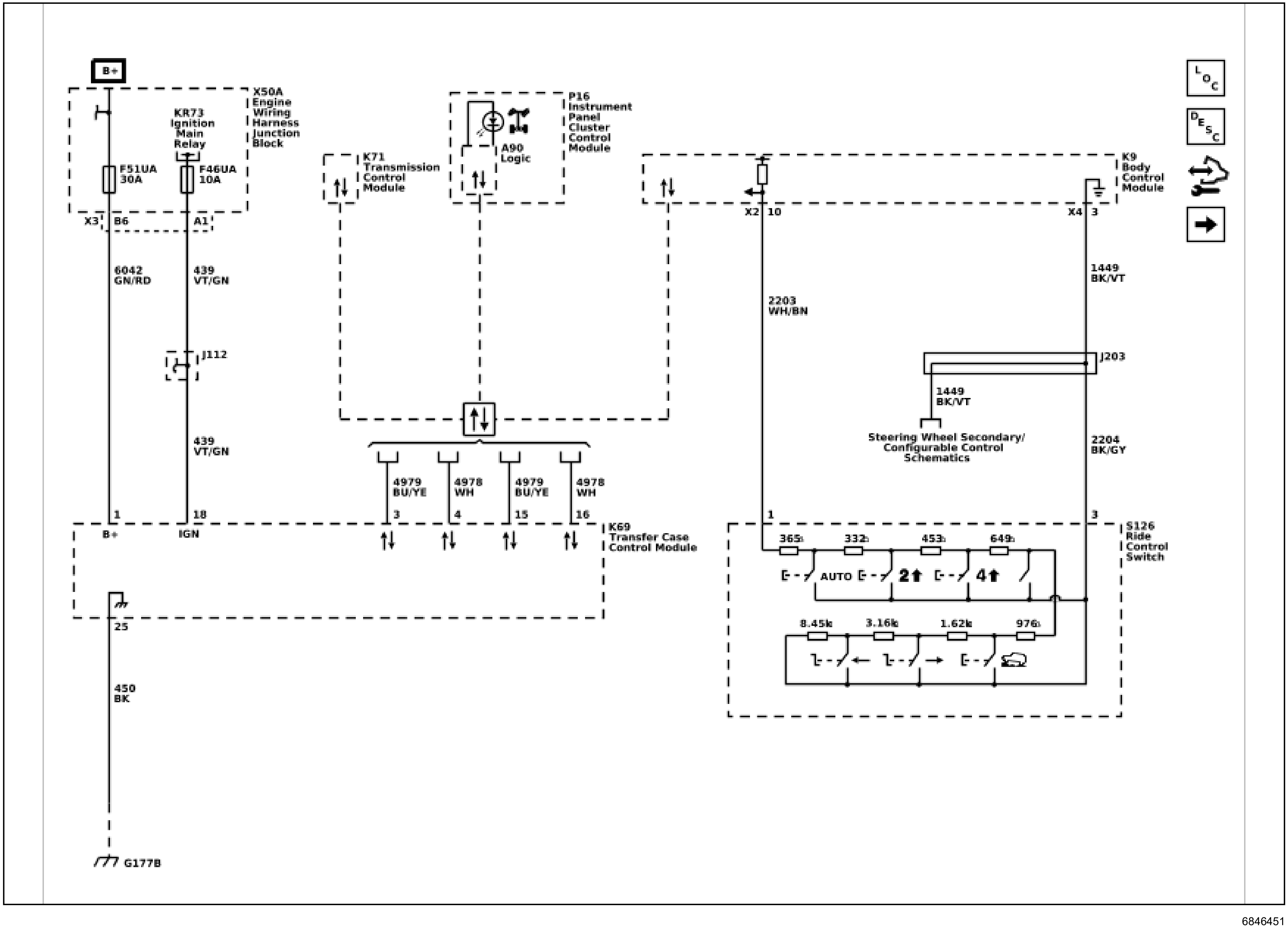
Since the shift lock control solenoid is permanently grounded, the BCM supplies voltage to the automatic transmission shift lock control solenoid, releasing the mechanical lock on the shift lever as the solenoid energizes. The energized solenoid allows the driver to move the shift lever out of the PARK position. When the brake pedal is not applied, the BCM turns the control voltage output of the shift lock control solenoid OFF, de-energizing the shift lock control solenoid. When the transmission is in the PARK position, the de-energized shift lock control solenoid will prevent shifting as the lever is mechanically locked in the PARK position.

During remote start operation the BCM will de-energize the automatic transmission shift lock control circuit, locking the shift lever in the PARK position

Transfer Case - MP 1625/1626

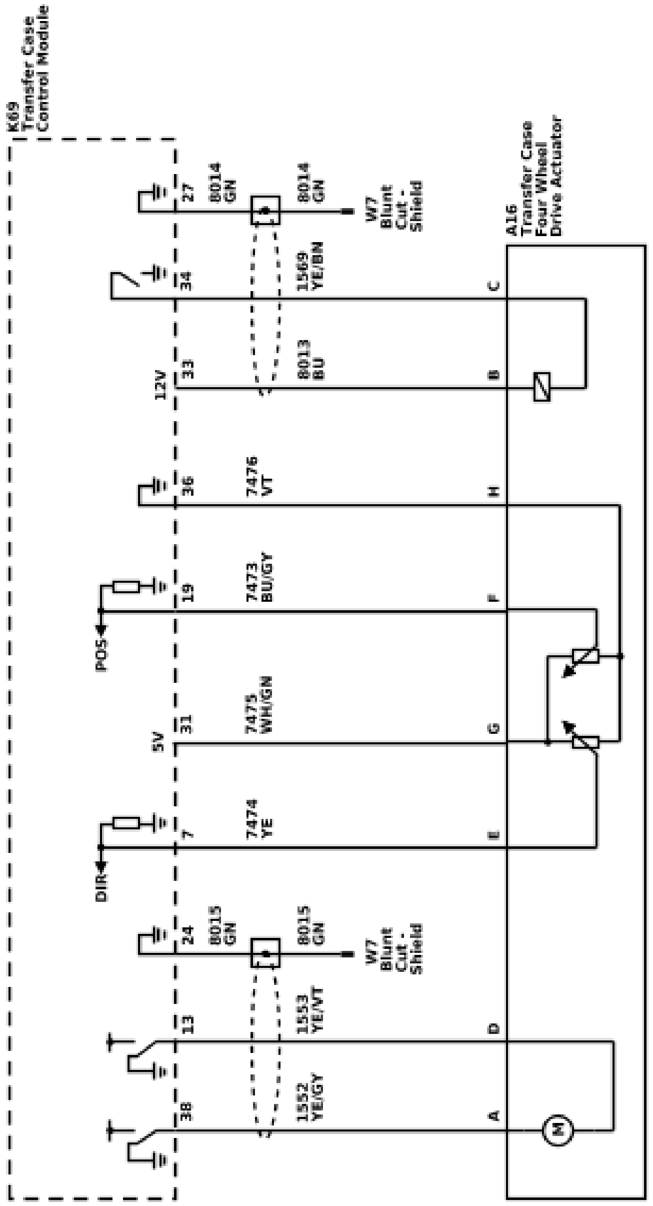
Schematic and Routing Diagrams

Transfer Case Control Schematics (Power, Ground, Serial Data and Shift Controls (NQF))

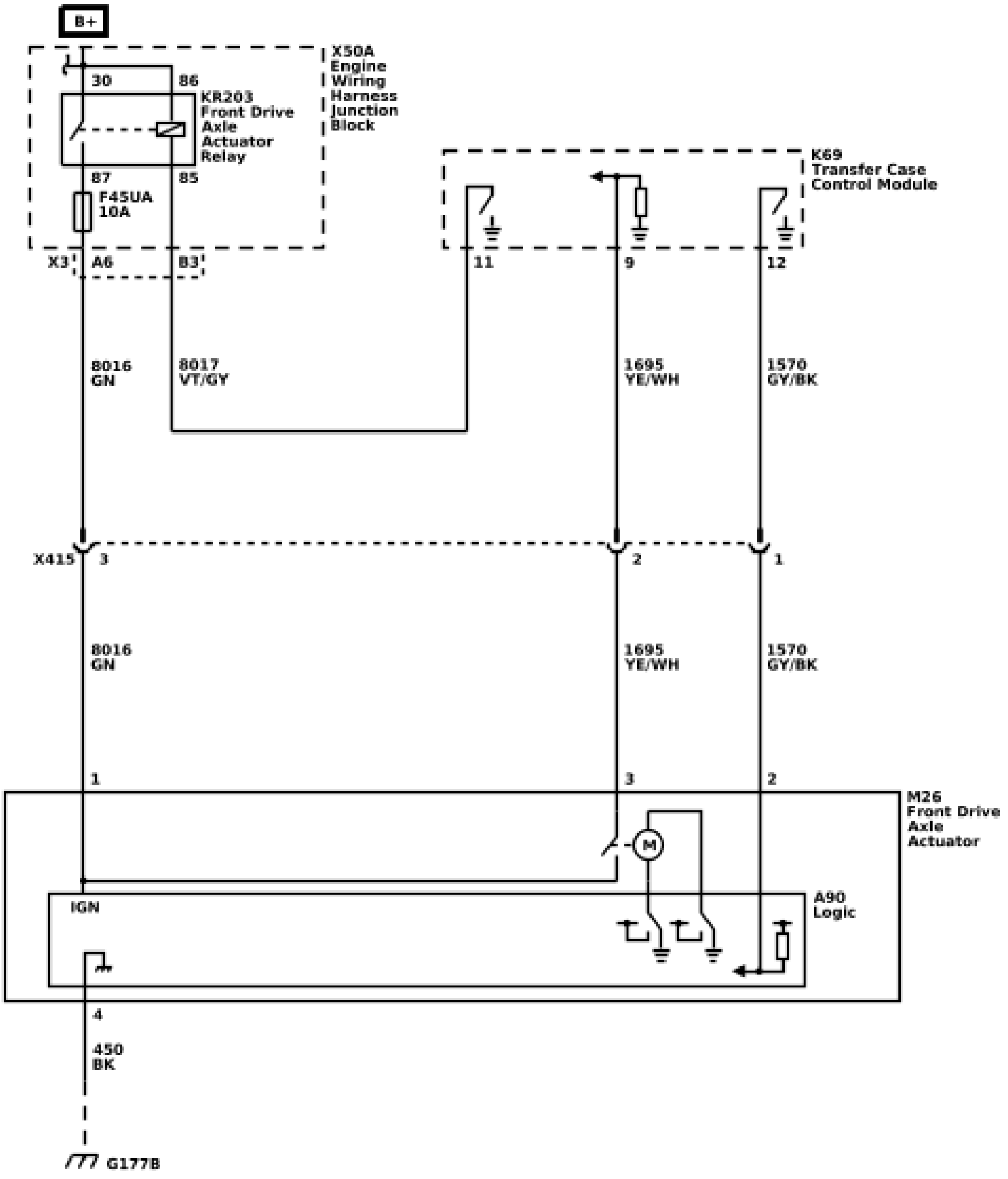

B+
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F51UA 30A
F46UA 10A
X3 B6
A1
6042 GN/RD
439 VT/GN
J112
439 VT/GN
K71 Transmission Control Module
P16 Instrument Panel Cluster Control Module
A90 Logic
K9 Body Control Module
X2 10
X4 3
2203 WH/BN
1449 BK/VT
J203
1449 BK/VT
Steering Wheel Secondary/ Configurable Control Schematics
2204 BK/GY
4979 BU/YE
4978 WH
4979 BU/YE
4978 WH
1
18
3
4
15
16
B+
IGN
K69 Transfer Case Control Module
25
450 BK
G177B
1
3
S126 Ride Control Switch
365Ω
332Ω
453Ω
649Ω
AUTO
2
4
8.45kΩ
3.16kΩ
1.62kΩ
976Ω
6846451

Transfer Case Control Schematics (Transfer Case Controls (NQF))

6846452


K69
Transfer Case
Control Module
27
8014
GN
8014
GN
W7
Blunt
Cut -
Shield
34
1569
YE/BN
12V
33
8013
BU
36
7476
VT
19
7473
BU/GY
POS
5V
31
7475
WH/GN
7
7474
YE
DIR
24
8015
GN
8015
GN
W7
Blunt
Cut -
Shield
13
1553
YE/VT
38
1552
YE/GY
A16
Transfer Case
Four Wheel
Drive Actuator
C
B
H
F
G
E
D
A
M

Transfer Case Control Schematics (Front Axle Controls (NQF))

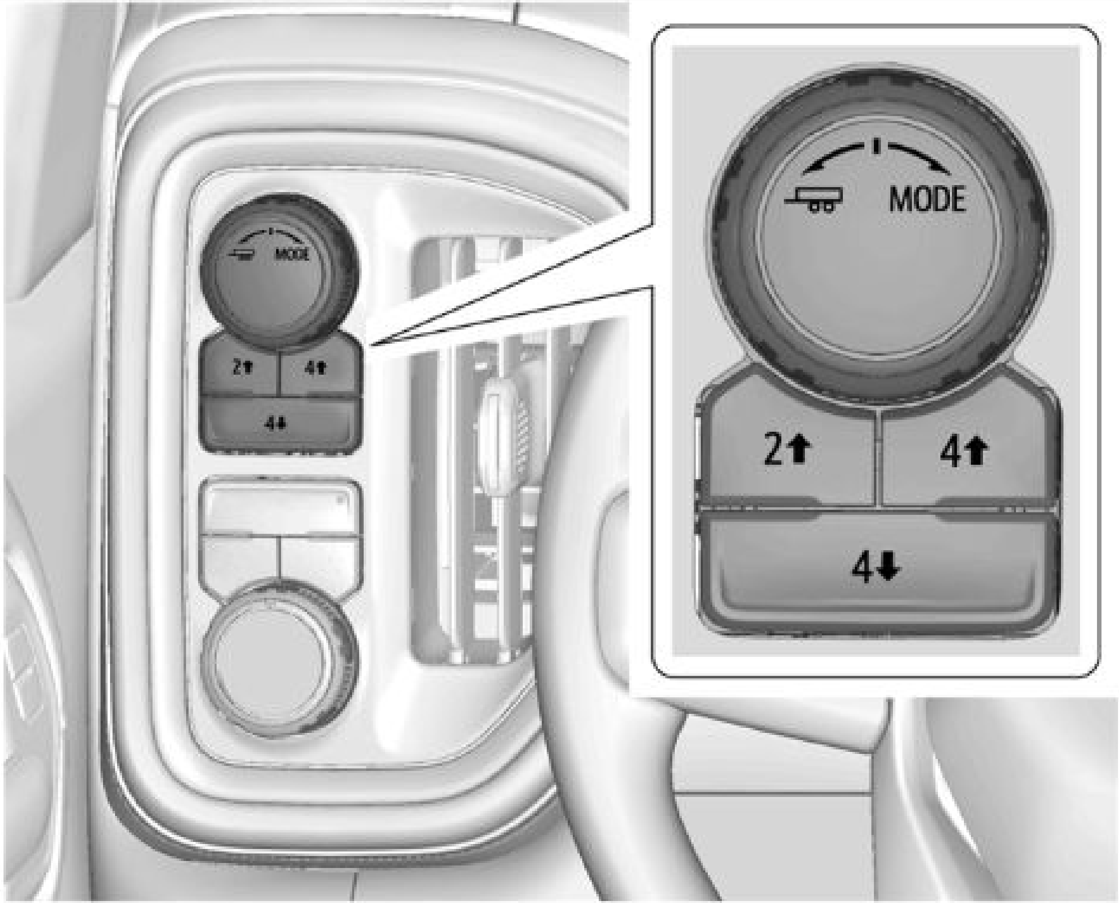

B+
X50A Engine Wiring Harness Junction Block
30
86
KR203 Front Drive Axle Actuator Relay
87
85
F45UA 10A
X3
A6
B3
K69 Transfer Case Control Module
11
9
12
8016 GN
8017 VT/GY
1695 YE/WH
1570 GY/BK
X415
3
2
1
8016 GN
1695 YE/WH
1570 GY/BK
1
3
2
M26 Front Drive Axle Actuator
M
A90 Logic
IGN
4
450 BK
G177B

6846453

Description and Operation

Transfer Case Description and Operation

Transfer Case Shift Control Switch



6255467

The NQF transfer case features a 4 mode shift control switch located on the instrument panel. When the ignition is in the RUN position, the transfer case shift control module monitors the transfer case shift control switch to determine if the driver desires a new mode/ range position. At a turn of the transfer case shift control switch, the lamp of the new desired position will begin flashing to inform the driver that the transfer case shift control module has received the request for a new mode/range position. The lamp continues to flash until all shifting criteria has been met and the new mode/ range position has been engaged. Once the new mode/ range position is fully active, the switch indicator for the new position will remain ON constantly. In the event that the transfer case shift control module cannot or will not complete the shift, the indicator switch flashes and returns to the previously selected position.

The transfer case provides the driver with 4 manual mode/range positions:

- 2HI – 2 Wheel Drive high range
- 4HI – 4 Wheel Drive high range
- 4LO – 4 wheel drive low range, 2.72:1 gear ratio reduction.
- NEUTRAL

The driver may choose to select any of these mode/ range positions while driving the vehicle. However, the transfer case will not allow a shift into or out of 4LO unless the following criteria has been met:

- The ignition switch is in RUN.
- The automatic transmission is in NEUTRAL.
- The vehicle speed is below 5 km/h (3 mph).

This transfer case also has a NEUTRAL position. A shift to the NEUTRAL position allows the vehicle to be towed without rotating the transmission output shaft. NEUTRAL position may be obtained only if the following criteria has been met:

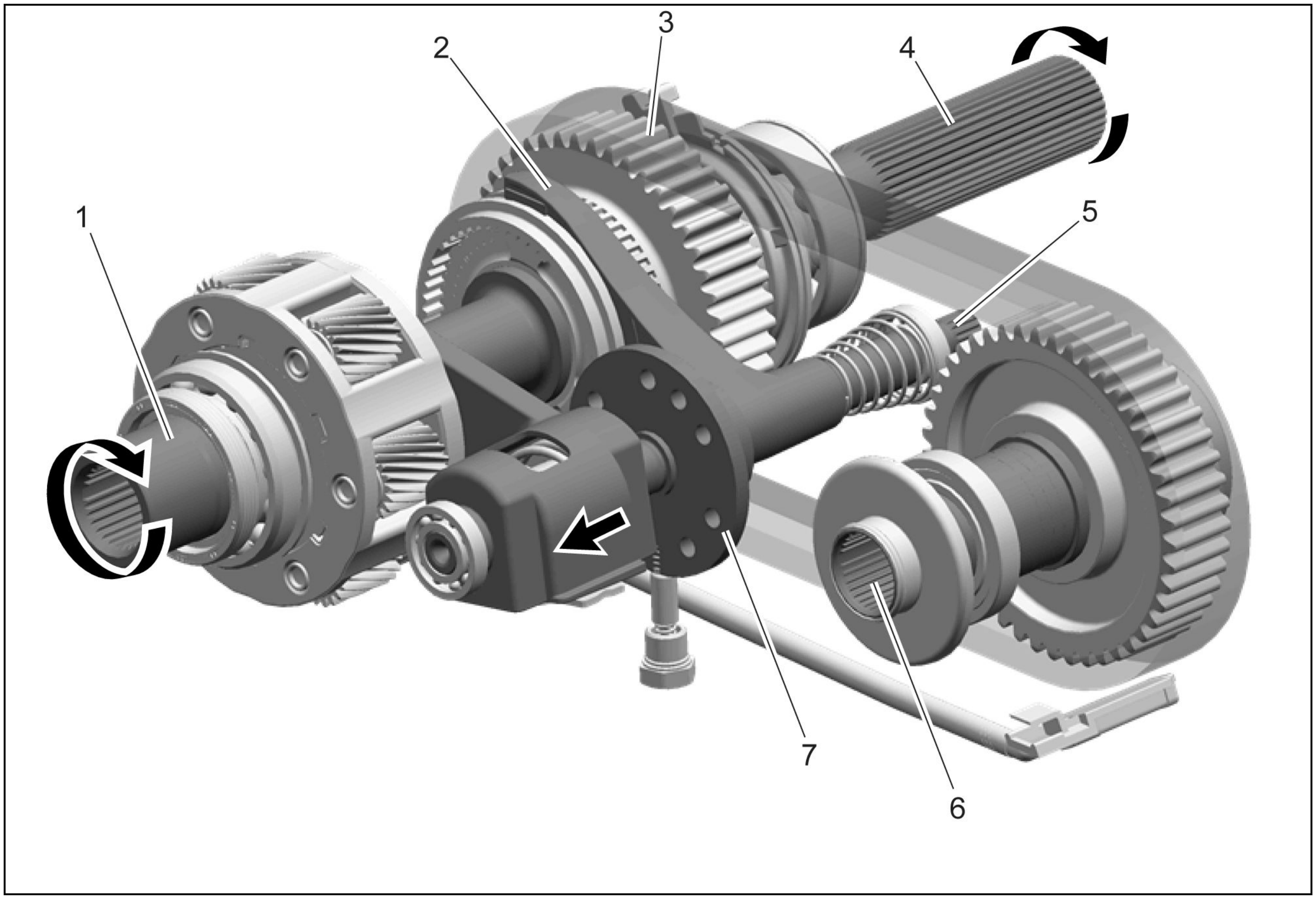
- The ignition switch is in RUN.
- The automatic transmission is in NEUTRAL.
- The vehicle speed is below 5 km/h (3 mph).
- The transfer case is in 2HI mode.

Once these conditions have been met, turn the rotary switch clockwise past 4 low and hold for 10 seconds. When the system completes the shift to NEUTRAL, the red NEUTRAL lamp will illuminate.

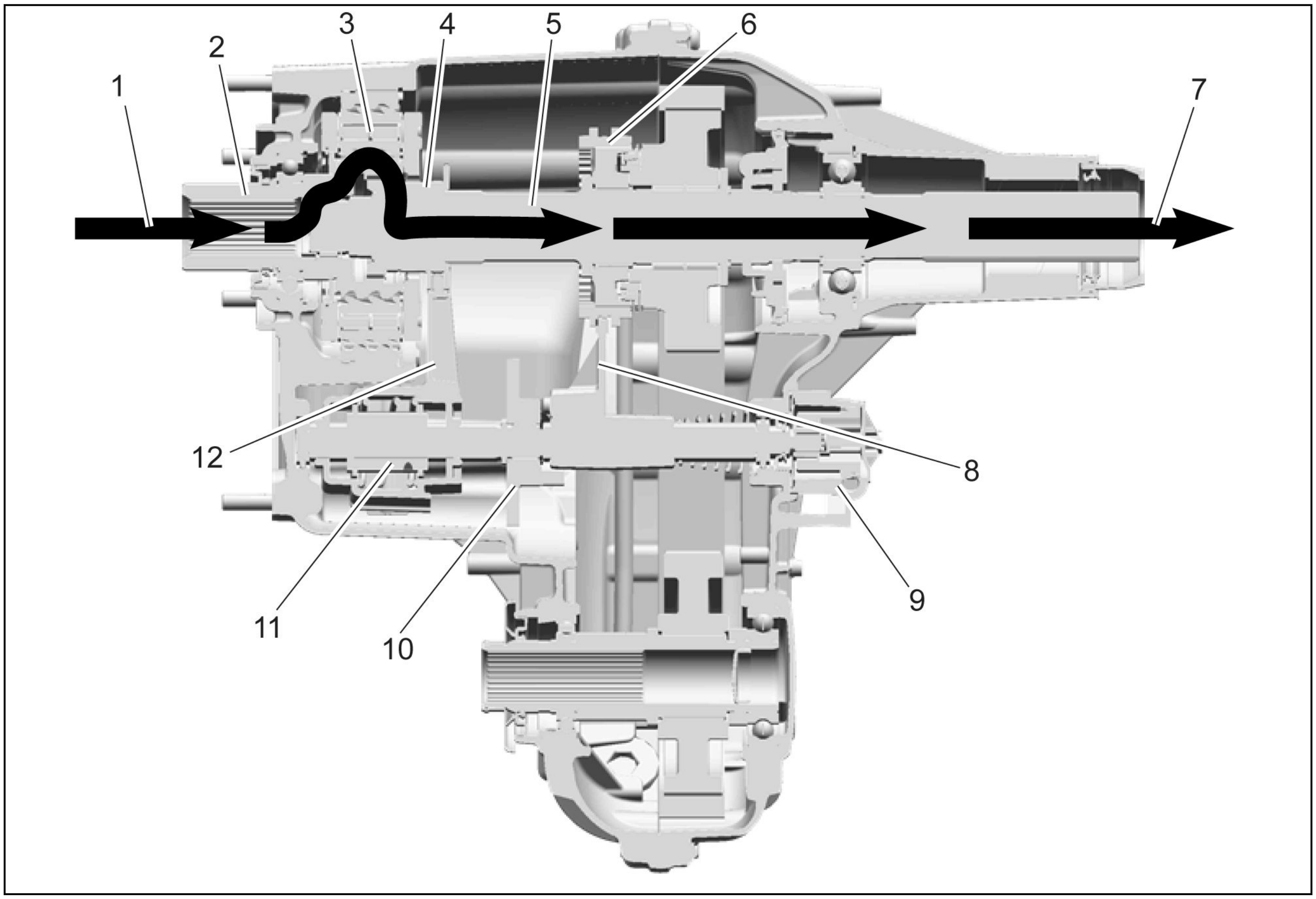
A shift to the NEUTRAL position allows the vehicle to be towed without rotating the transmission output shaft. In the NEUTRAL position, the rear propeller shaft rotates the transfer case rear output shaft, in turn rotating the oil pump, thus providing constant lubrication during towing. This NEUTRAL position is a 4WD NEUTRAL, meaning the front and rear outputs of the transfer case are engaged as though in 4HI. With a disengaged front axle, there is no power flow to the front wheels, thus allowing towing with the front wheels off the ground or flat towing without driveline binding.

2WD Mode Power Flow

2WD Mode Power Flow



(1) Input Shaft
(2) Two/Four Shift Fork
(3) Drive Chain
(4) Rear Output Shaft
(5) Control Actuator Shaft
(6) Front Output Shaft
(7) Drive Actuator Cam

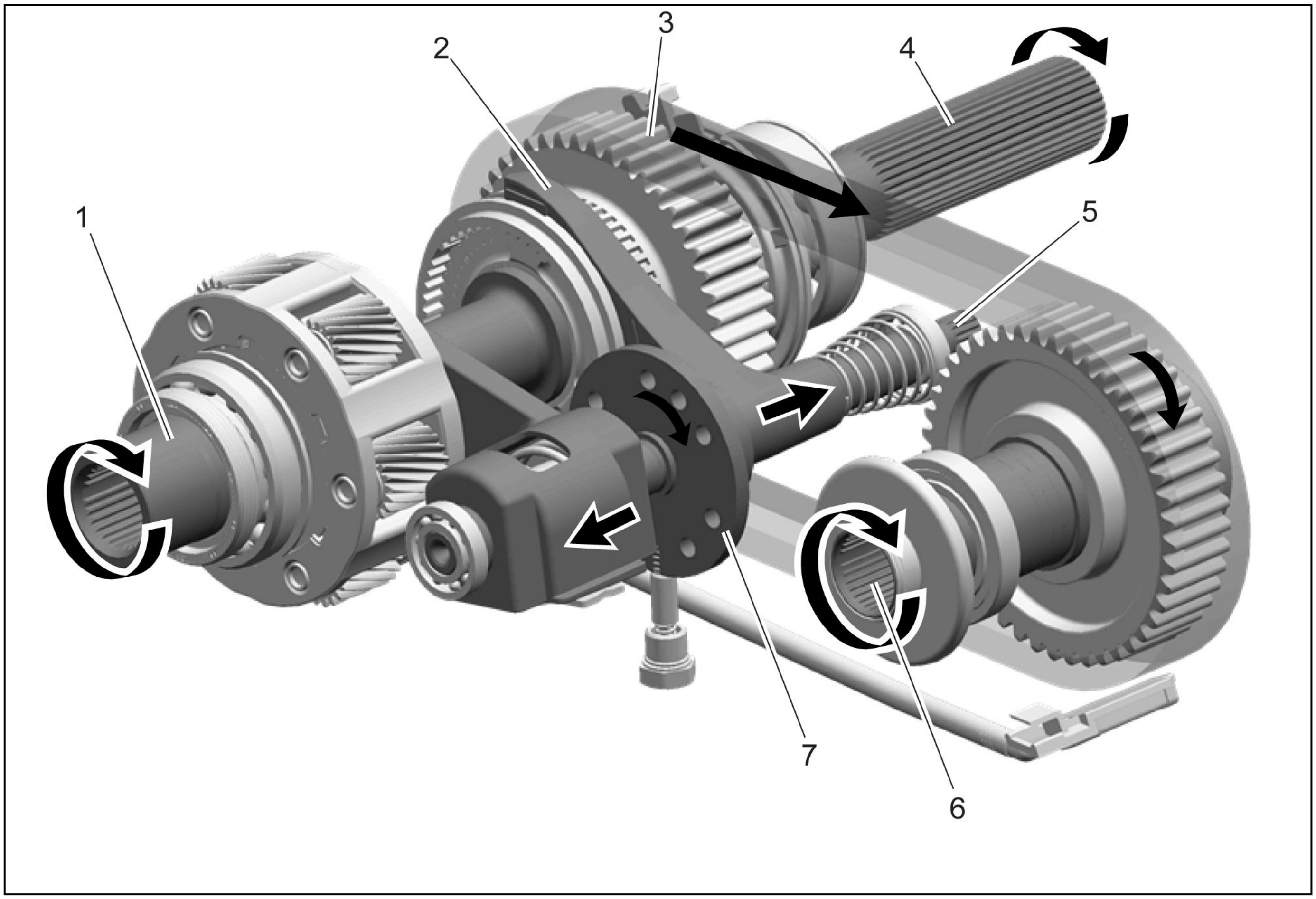

1
2
3
4
5
6
7
8
9
10
11
12

5394859

The transfer case is shifted by an encoder motor (9) on the control actuator shaft. The control actuator shaft rotates the 2/4 wheel drive actuator cam (10) and moves the high/low range shift fork (12) or the 2/4 wheel drive mode shift fork (8). Depending on the selected mode or range, the shift forks move either the high/low clutch (4) for the high/low range planetary assembly (3) or the synchronizer sleeve (6) for the 2/4 wheel drive mode. In 2WD mode, the engine power from the transmission (1) is delivered to the input shaft (2). The engagement teeth on the inside of the input shaft (2) are engaged to the outer teeth on the high/low clutch (4). The high/low clutch (4) is slip splined to rear output shaft (5). The engine power flows from the high/low clutch (4) to the rear output shaft (5) and delivered to rear propeller shaft (7).

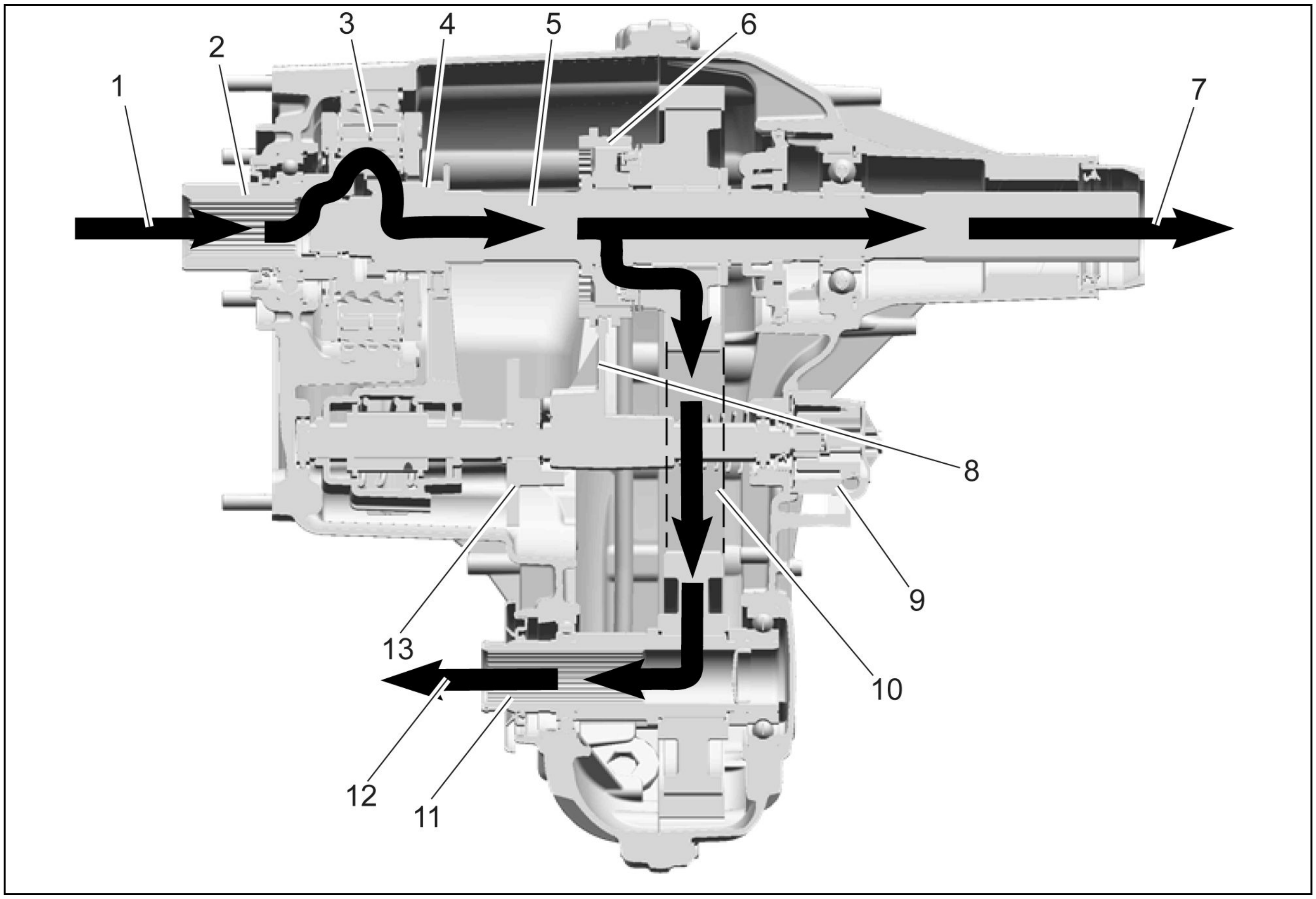
4HI Mode Power Flow

4HI Mode Power Flow



5394862

(1) Input Shaft
(2) Two/Four Shift Fork
(3) Drive Chain
(4) Rear Output Shaft
(5) Control Actuator Shaft
(6) Front Output Shaft
(7) Drive Actuator Cam

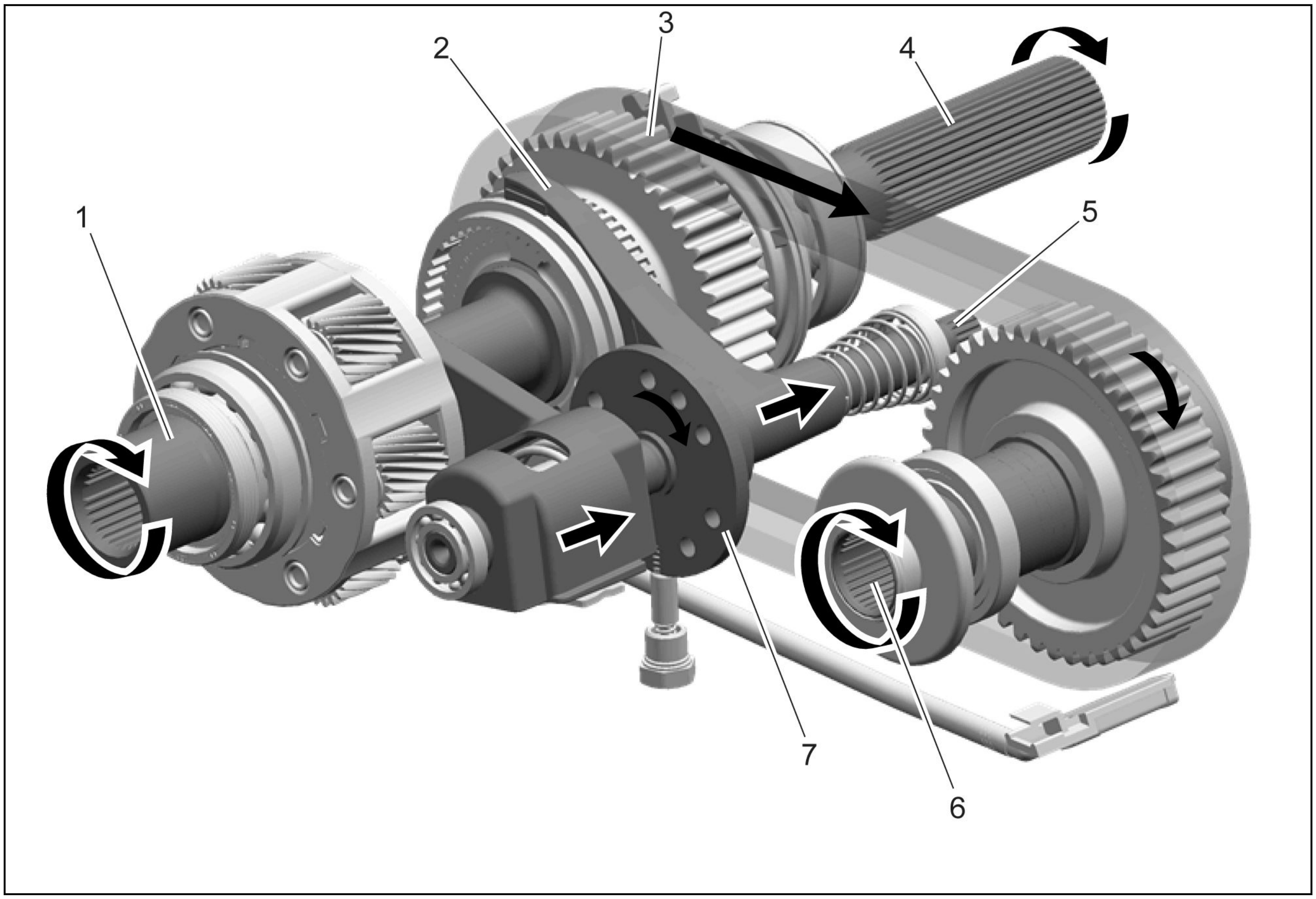

1
2
3
4
5
6
7
8
9
10
11
12
13

5394861

In 4HI mode, the engine power from the transmission (1) is delivered to the input shaft (2). The engagement teeth on the inside of the input shaft (2) are engaged to the outer teeth on the high/low clutch (3). The high/low clutch (3) is slip splined to the rear output shaft (4). During a shift mode from 2HI to 4HI, the cam profile on the 2/4 wheel drive actuator cam (13) pushes the 2/4 wheel drive mode shift fork (9) and the synchronizer sleeve. The sleeve, engaging the synchronizer (8), equalizes the front propeller shaft (12) and rear propeller shaft (7) speeds. The sleeve then engages to the drive sprocket (6). The engine power flow for driving the front propeller shaft (12), now travels from the rear output shaft (4) to the synchronizer hub (5), which is splined to the rear output shaft (4). The power flows from the synchronizer hub (5) to the sleeve and then to the drive sprocket (6). The power flow is transmitted by a chain (10) to the driven sprocket on the front output shaft (11) and to the front propeller shaft (12). The front and rear propeller shafts are being driven at equal RPM, therefore giving a four wheel drive mode. This mode should only be used for extra traction. Using this mode on dry pavement causes tire scuffing when turning.

4LO Mode Power Flow

4LO Mode Power Flow



5394864

(1) Input Shaft

(2) Two/Four Shift Fork

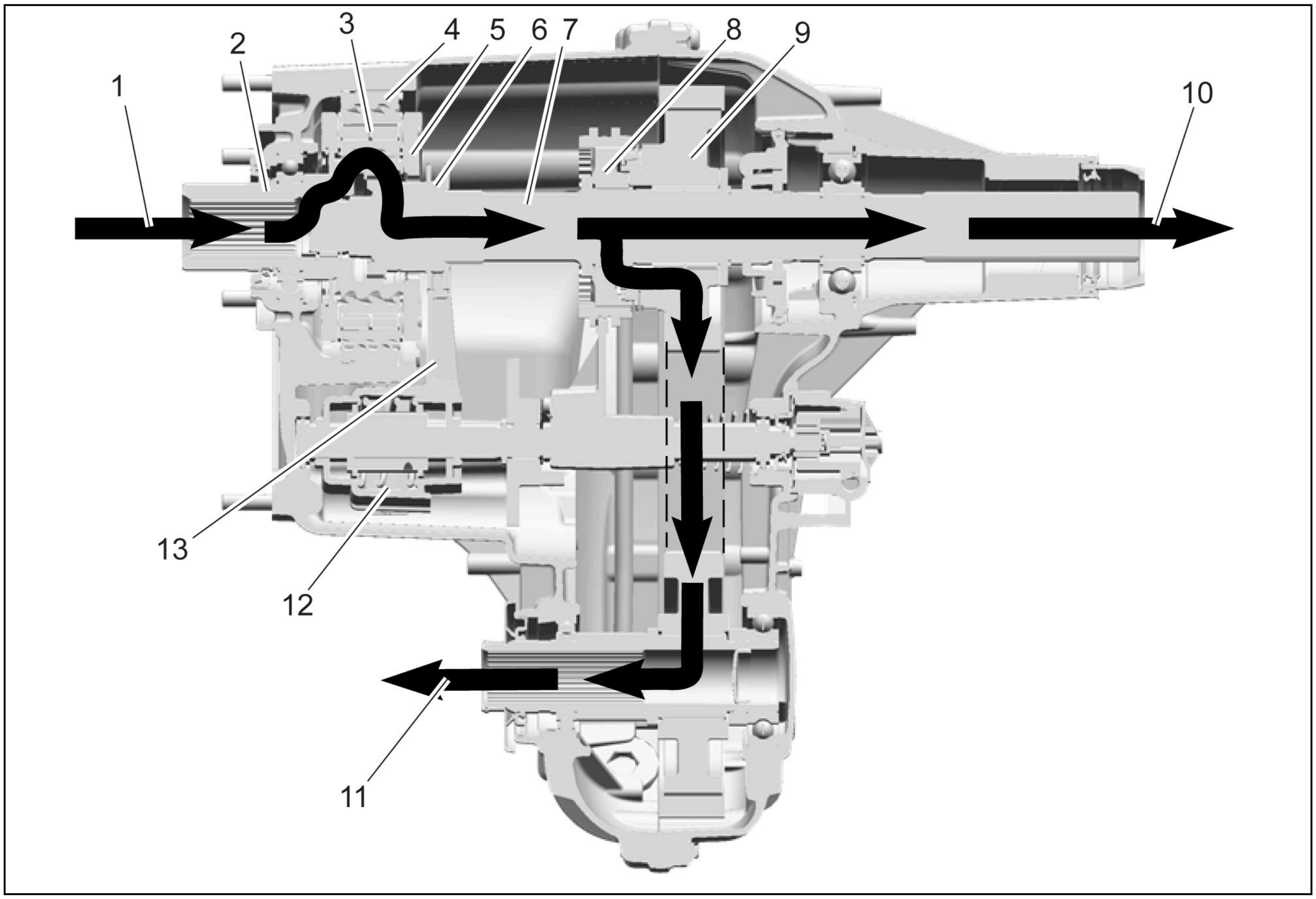
(3) Drive Chain

(4) Rear Output Shaft

(5) Control Actuator Shaft

(6) Front Output Shaft

(7) Drive Actuator Cam



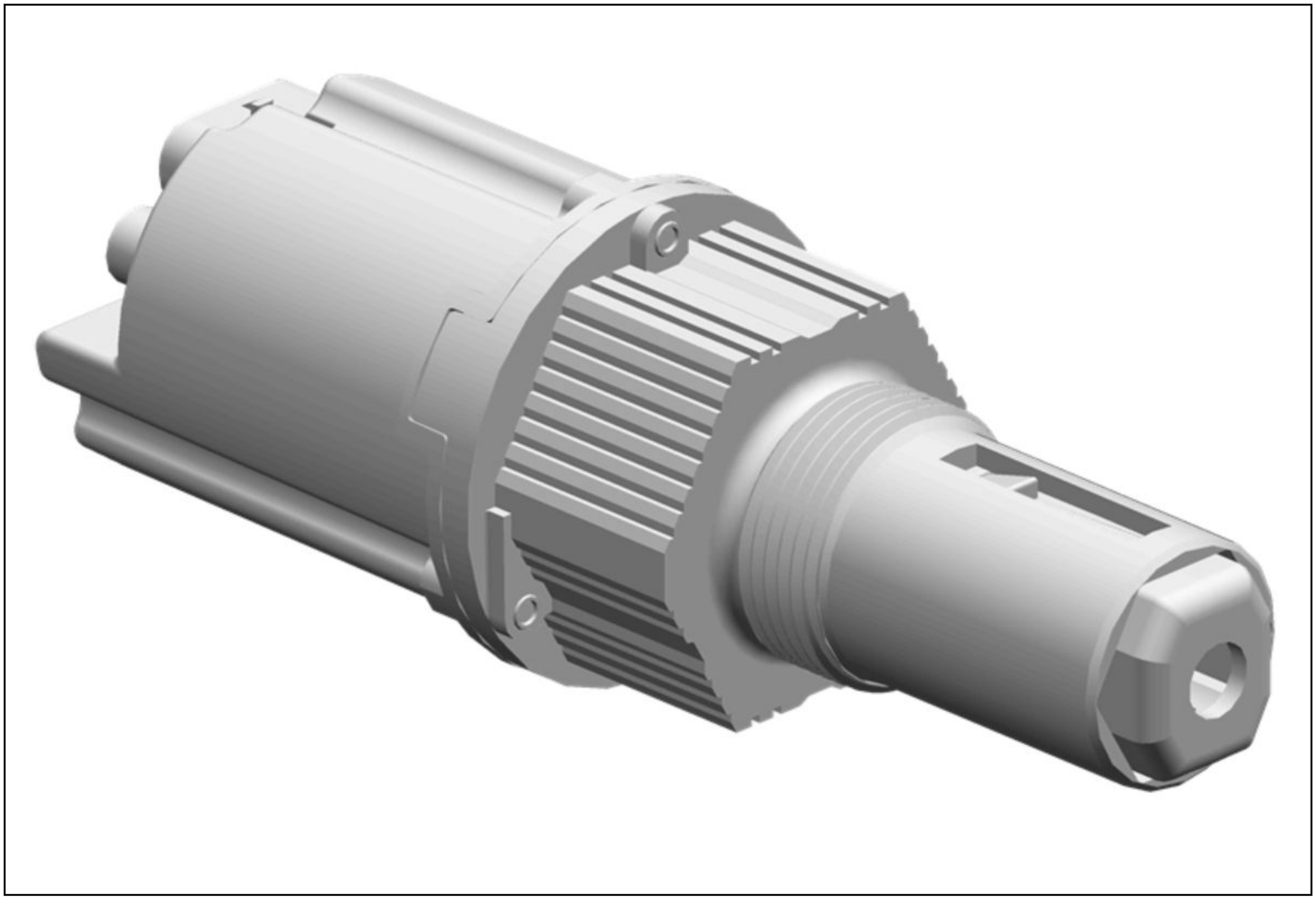
5394863

During a range shift request to 4LO, a separate cam profile, in the high/low shift fork spring assembly (12), moves the high/low shift fork (13). The high/low shift fork (13) moves the high/low clutch (6) rearward. The high/low clutch (6) outer teeth disengage from the input shaft (2) high-speed teeth. The high/low clutch (6) outer teeth then engage in the high/low planetary carrier teeth (5). The power flow is now from the transmission (1) to the planetary teeth on the input shaft (2) to the planetary gears (3) in the high/low planetary carrier assembly (5). Rotating the planetary gears (3), which are engaged in the high/low internal gear (4), rotates the high/low planetary carrier assembly (5). The high/low planetary carrier assembly (5) delivers the power to the high/low clutch (6). The high/low clutch (6) then drives the rear output shaft (7), providing a 2.68:1 gear ratio reduction to the rear output shaft (7). The sleeve is still engaged to drive the drive sprocket (9), as in the 4HI position, providing the engine power to the rear propeller shaft (10) and to the front propeller shaft (11).

NEUTRAL Mode Power Flow

Shifting to the NEUTRAL position, the high/low clutch is centered between the input shaft and the high/low planetary carrier. The high/low clutch is not engaged with either the input shaft or the high/low planetary carrier teeth. The 2/4 wheel drive synchronizer is in the 4HI mode position.

Front Axle Actuator



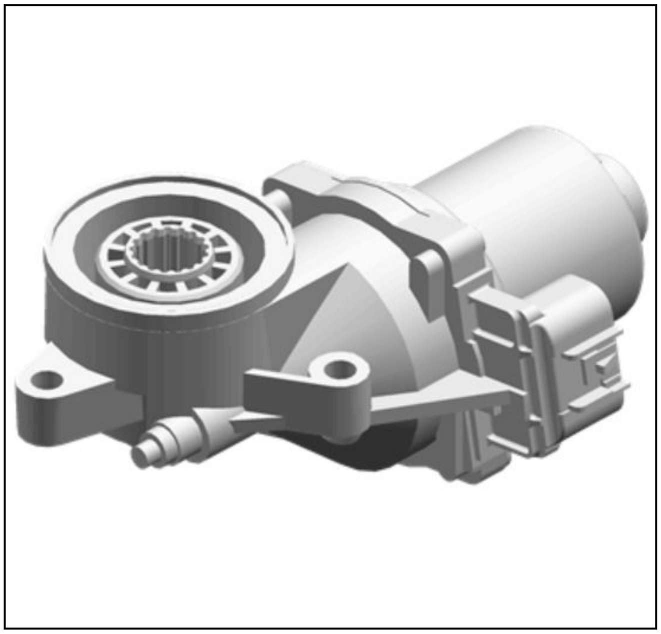
2263721

The front axle actuator engages and disengages the front axle. The front axle actuator consists of a permanent magnetic (PM) motor, a worm gear controlled plunger, a front axle switch and an electronic control circuit. When a range shift to 4HI, or 4LO is requested, the transfer case shift control module requests engagement of the front axle by grounding the axle actuator control circuit through a current limiting driver. The front axle actuator also sends a return signal to the transfer case shift control module indicating when the 4WD is engaged.

Service 4 Wheel Drive Message

The Service 4 Wheel Drive Message is a display within the drivers information center (DIC) and cannot be serviced separately. This message is used to inform the driver that a transfer case system condition has occurred. The Service 4 Wheel Drive Message is controlled by the transfer case shift control module via GMLAN.

Transfer Case Two/Four Wheel Drive Actuator Assembly



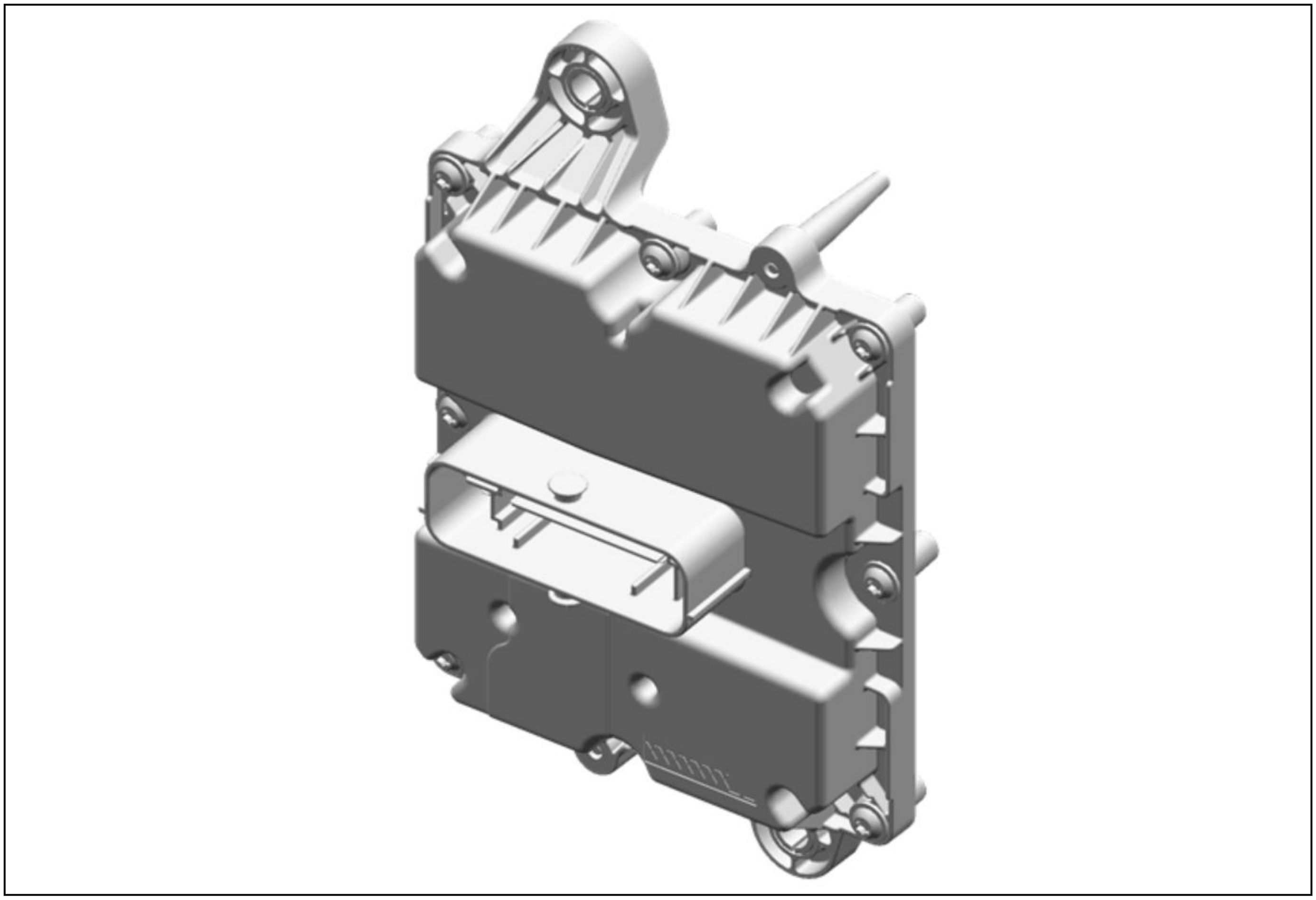
1986215

The transfer case two/four wheel drive actuator assembly consists of a PM DC motor and gear reduction assembly. It is located on the left side, driver's side, of the transfer case. When activated, it turns the sector shaft of the transfer case clockwise or counter clockwise to shift the transfer case. The encoder motor is controlled by the transfer case shift control module. This circuit consists of a driver on both the motor control A and motor control B circuits. The encoder motor is bi-directional, to allow the motor to shift the transfer case from 2HI or 4HI to NEUTRAL and 4LO positions. The transfer case encoder motor can be fully driven clockwise or counterclockwise using a scan tool. You may also monitor motor control A and B circuits using a scan tool.

The two/four wheel drive actuator assembly also has a built in incremental sensor. This device is a linear encoder. The transfer case shift control module sends a 5 volt reference signal to the encoder. The transfer case shift control module reads the voltage back based on the exact position of the sector shaft of the transfer case. The transfer case shift control module knows if a shift has been completed and if the shift is somewhere in between.

The encoder motor on the does not have an internal brake like the NVG 246. The encoder motor is not serviceable and must be replaced as an assembly.

Transfer Case Shift Control Module



5071149

The transfer case shift control module has been standardized for all K trucks. The transfer case shift control module contains the same hardware, boot software, and operational software found in other GM K trucks. The only difference is the calibration file downloaded into the transfer case shift control module memory. The transfer case shift control module comes with the appropriate calibrations out of the factory, but new calibrations must be flashed into the transfer case shift control module during service. This is especially important if a new transfer case shift control module is installed during service. Calibration files may be introduced irregularly. See your technical service bulletins.

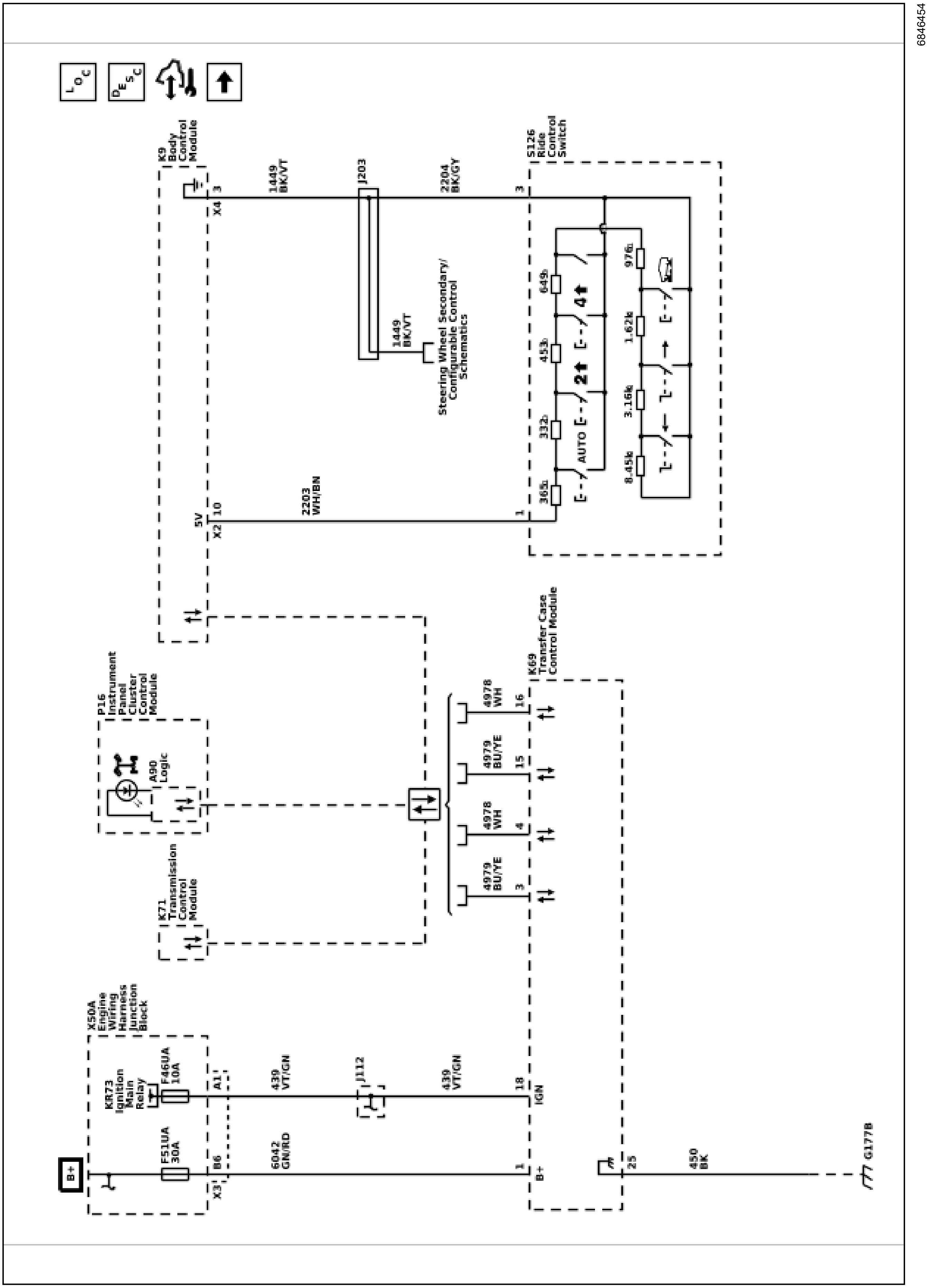
Vehicle Speed Sensor (VSS)

There is a VSS mounted to the transfer case on the rear output shaft. The VSS is a PM generator. The PM generator produces an AC voltage. The AC voltage and frequency increases as speed increases. The VSS is an input to the powertrain control module (PCM). The PCM sends this information to the transfer case shift control module via the GM LAN serial data bus.

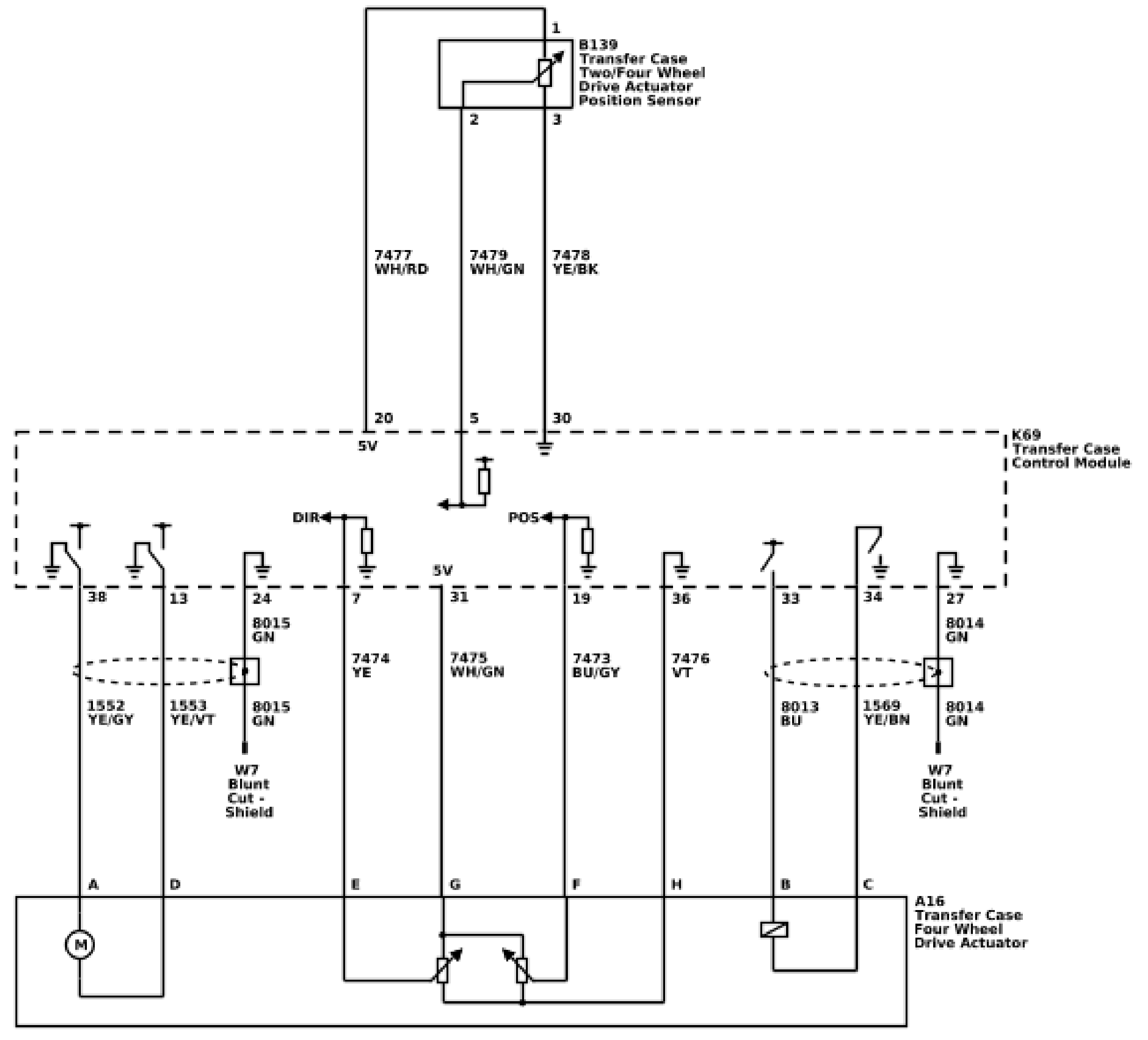
Transfer Case - MP 3023/3024

Schematic and Routing Diagrams

Transfer Case Control Schematics (Power, Ground, Serial Data and Shift Controls (NQH))

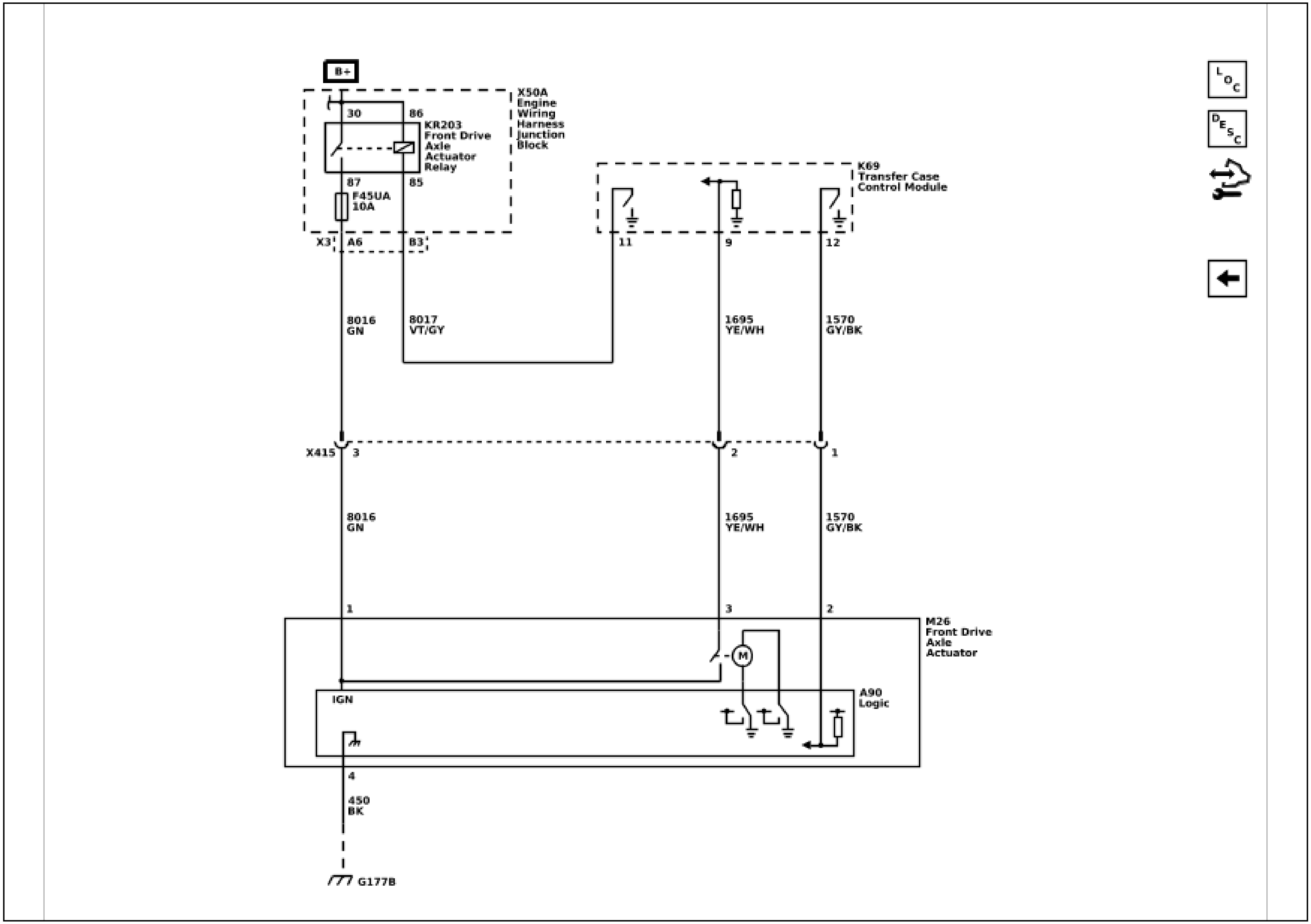

6846454
K9 Body Control Module
X4 3
1449 BK/VT
J203
2204 BK/GY
3
S126 Ride Control Switch
1449 BK/VT
Steering Wheel Secondary/ Configurable Control Schematics
5V
X2 10
2203 WH/BN
1
649Ω
453Ω
332Ω
365Ω
976Ω
1.62k
3.16k
8.45k
4
2
AUTO
P16 Instrument Panel Cluster Control Module
A90 Logic
K71 Transmission Control Module
K69 Transfer Case Control Module
4978 WH
16
4979 BU/YE
15
4978 WH
4
4979 BU/YE
3
X50A Engine Wiring Harness Junction Block
KR73 Ignition Main Relay
F46UA 10A
A1
439 VT/GN
J112
439 VT/GN
18
IGN
B+
F51UA 30A
B6
X3
6042 GN/RD
1
B+
25
450 BK
G177B

Transfer Case Control Schematics (Transfer Case Controls (NQH))


B139
Transfer Case
Two/Four Wheel
Drive Actuator
Position Sensor
1
2
3
7477
WH/RD
7479
WH/GN
7478
YE/BK
20
5
30
5V
K69
Transfer Case
Control Module
DIR
POS
5V
38
13
24
7
31
19
36
33
34
27
8015
GN
7474
YE
7475
WH/GN
7473
BU/GY
7476
VT
8014
GN
1552
YE/GY
1553
YE/VT
8015
GN
8013
BU
1569
YE/BN
8014
GN
W7
Blunt
Cut -
Shield
W7
Blunt
Cut -
Shield
A
D
E
G
F
H
B
C
M
A16
Transfer Case
Four Wheel
Drive Actuator

6846455

Transfer Case Control Schematics (Front Axle Controls (NQH))


B+
X50A Engine Wiring Harness Junction Block
30
86
KR203 Front Drive Axle Actuator Relay
87
85
F45UA 10A
X3
A6
B3
K69 Transfer Case Control Module
11
9
12
8016 GN
8017 VT/GY
1695 YE/WH
1570 GY/BK
X415
3
2
1
8016 GN
1695 YE/WH
1570 GY/BK
1
3
2
M26 Front Drive Axle Actuator
M
IGN
A90 Logic
4
450 BK
G177B

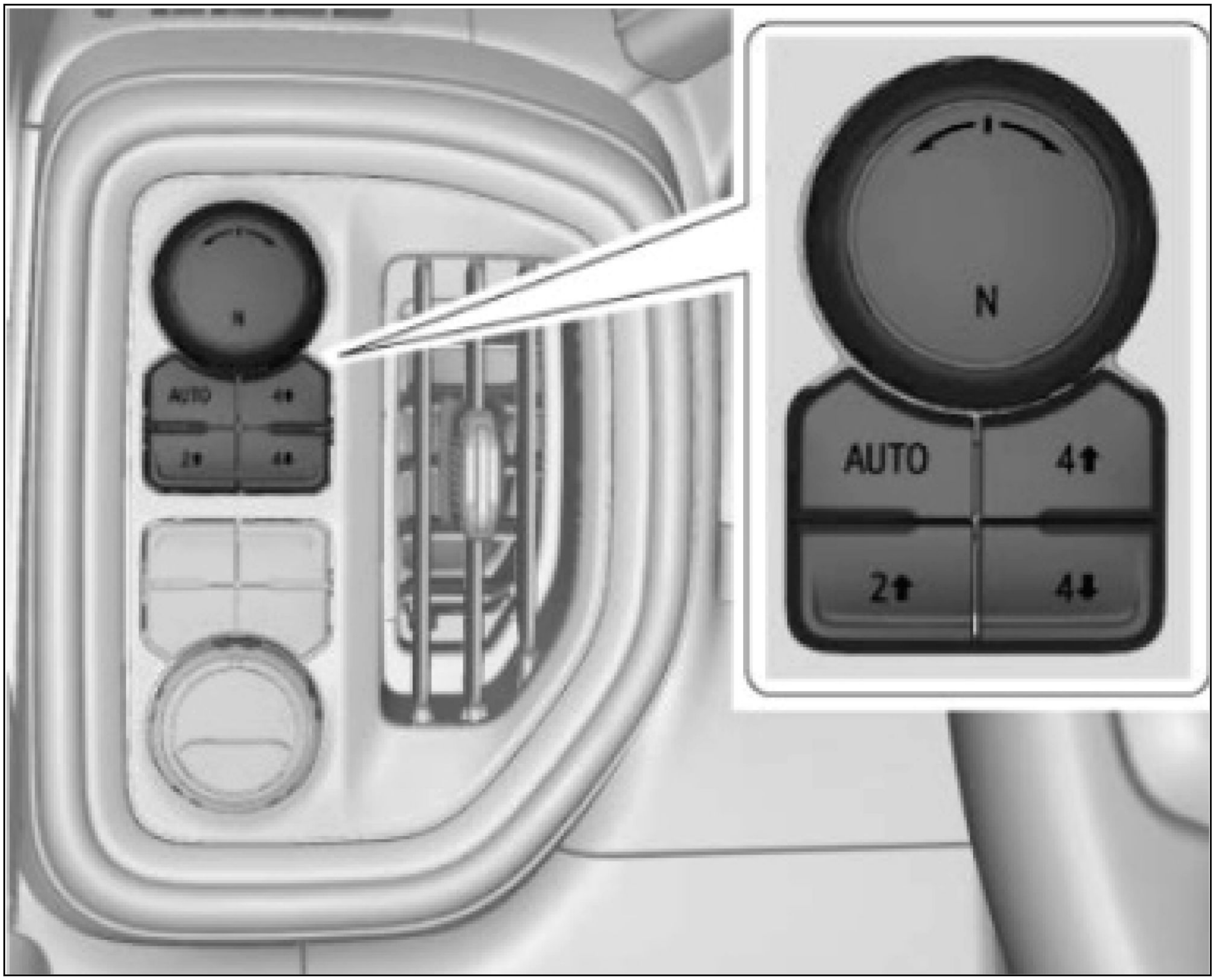
6846456

Description and Operation

Transfer Case Description and Operation

The NQH transfer case is a 2 speed automatic, active transfer case (ATC). The ATC provides 5 modes, Auto, 4WD, 4HI, 4LO, 2HI and NEUTRAL. The Auto 4WD position allows the capability of an active transfer case, which provides the benefits of on-demand torque biasing wet clutch and easy vehicle tuning through software calibrations. The software calibrations allow more features such as flexible adapt ready position and clutch preload torque levels. The technology allows for vehicle speed dependent clutch torque levels to enhance the performance of the system. For example, the system is calibrated to provide 0–6.78 newtonm (0–5 lb ft) of clutch torque during low speed, low engine torque operation, and predetermined higher torque for 40 km/h (25 mph) and greater. This prevents crow-hop and binding at low speeds and provides higher torque biases at higher vehicle speeds, in order to enhance stability.

Transfer Case Shift Control Switch



4994734

The transfer case features a 5 mode shift control switch located on the instrument panel. When the ignition key is in the RUN position, the transfer case shift control module monitors the transfer case shift control switch to determine if the driver desires a new mode/range position.

To command a shift, press button of the new desired state. The actual 4x4 shift request is only made after the button is released. Transfer Case state will be displayed in the Cluster at all times. Graphic location could vary depending on trim level. However, graphics will be consistent. The graphic in the cluster will blink while a shift is in progress. The graphic will change to indicate the mode requested. When the shift is complete, the graphic will stop blinking and become steady. If the transfer case cannot complete a shift, the graphic will return to the previously selected mode. While shift is in progress, cluster will display following DIC message: “4WD Shift in Progress”. The DIC message will turn off once the shift is complete.

During normal driving situations, the transfer case can operate in the Auto 4WD mode. In the Auto 4WD mode, the transfer case shift control module monitors rear wheel slip speed, based on the inputs from the wheel speed sensors and/or vehicle speed sensor. When the vehicle experiences a rear wheel slip condition, the transfer case shift control module sends a pulse width modulated (PWM) signal to an electronic motor, which is the transfer case 2/4 wheel drive actuator assembly. This actuator rotates the transfer case control actuator shaft, applying a clutch. The clutch is designed to deliver a variable amount of torque, normally delivered to the rear wheels, and transfers it to the front wheels. Torque is ramped up to the front wheels until the front wheel speed sensor matches that of the rear wheel speed sensors and/or vehicle speed sensor. Torque is ramped down to the front wheels. The process would repeat if rear wheel slip is detected again.

The MP 3025 ATC transfer case has the added feature of also providing the driver with 4 manual mode/range positions:

- 4HI – 4 Wheel Drive high range
- 2HI – 2 Wheel Drive high range
- 4LO – 4 wheel drive low range, 2.72:1 gear ratio reduction.
- Neutral

The driver may choose to select any of these mode/range positions while driving the vehicle. However, the transfer case will not allow a shift into or out of 4LO unless the following criteria has been met:

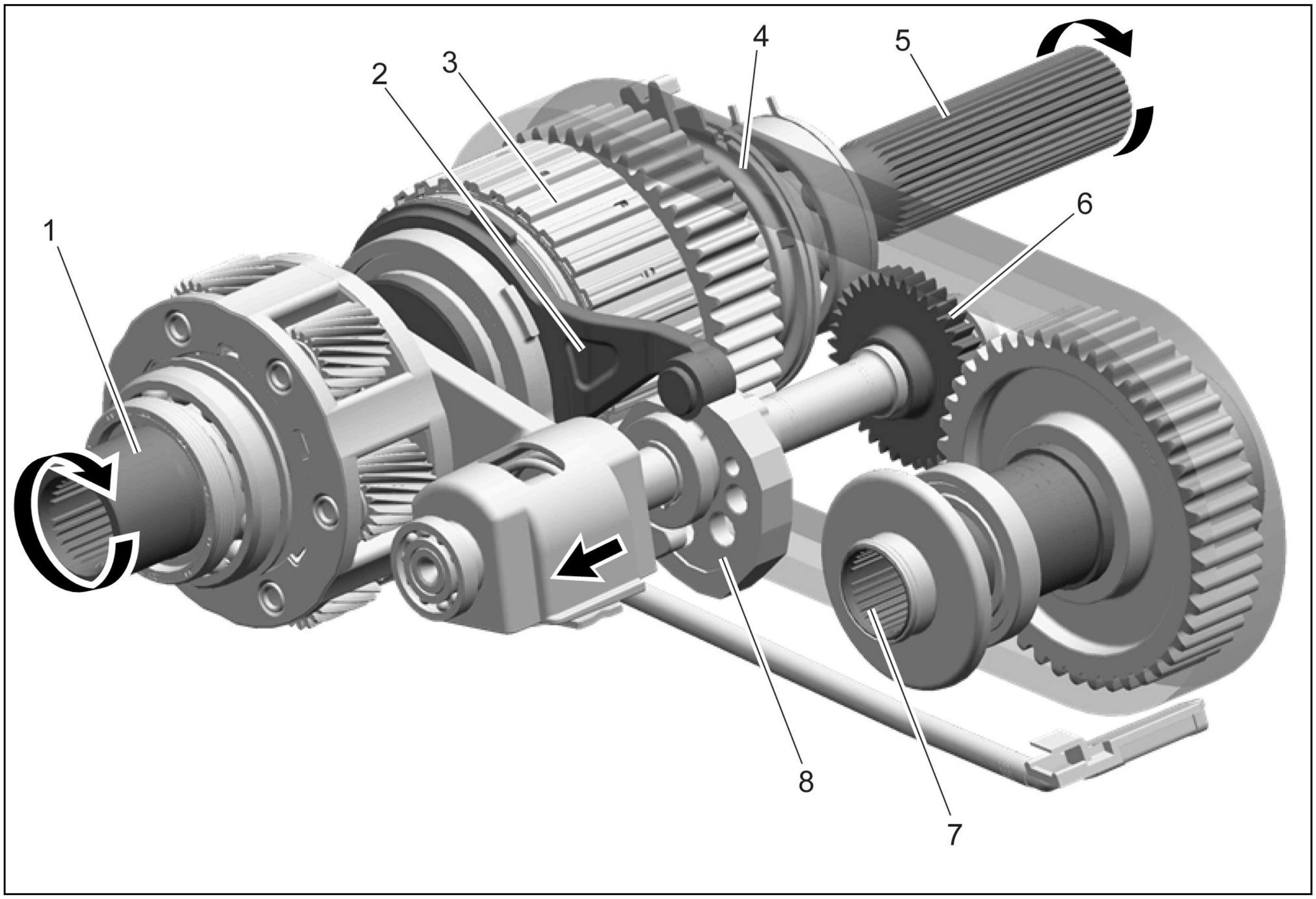
- The ignition switch is in RUN.
- The automatic transmission is in NEUTRAL.
- The vehicle speed is below 5 km/h (3 mph).

This transfer case also has a NEUTRAL position. A shift to the NEUTRAL position allows the vehicle to be towed without rotating the transmission output shaft. In the NEUTRAL position, the rear propeller shaft rotates the transfer case rear output shaft, in turn rotating the oil pump, thus providing constant lubrication during towing. NEUTRAL position may be obtained only if the following criteria have been met:

- Start the vehicle or turn the ignition on.
- Shift the transmission to NEUTRAL.
- Shift the transfer case to 2 HI. (Shifts to transfer case neutral are only allowed when transfer case initial state is 2 HI.)
- Apply park brake and/or Service brake. If Park Brake and/or service brake is not applied within 20 seconds, transfer case will remain in original state.

Once these conditions have been met, Press 2 HI 5 sequential times in 10 seconds until the Transfer Case N (Neutral) graphic starts blinking in cluster. When shift to Transfer Case N (Neutral) is complete, graphic in cluster will be steady. When the system completes the shift to NEUTRAL, the red NEUTRAL lamp will illuminate.

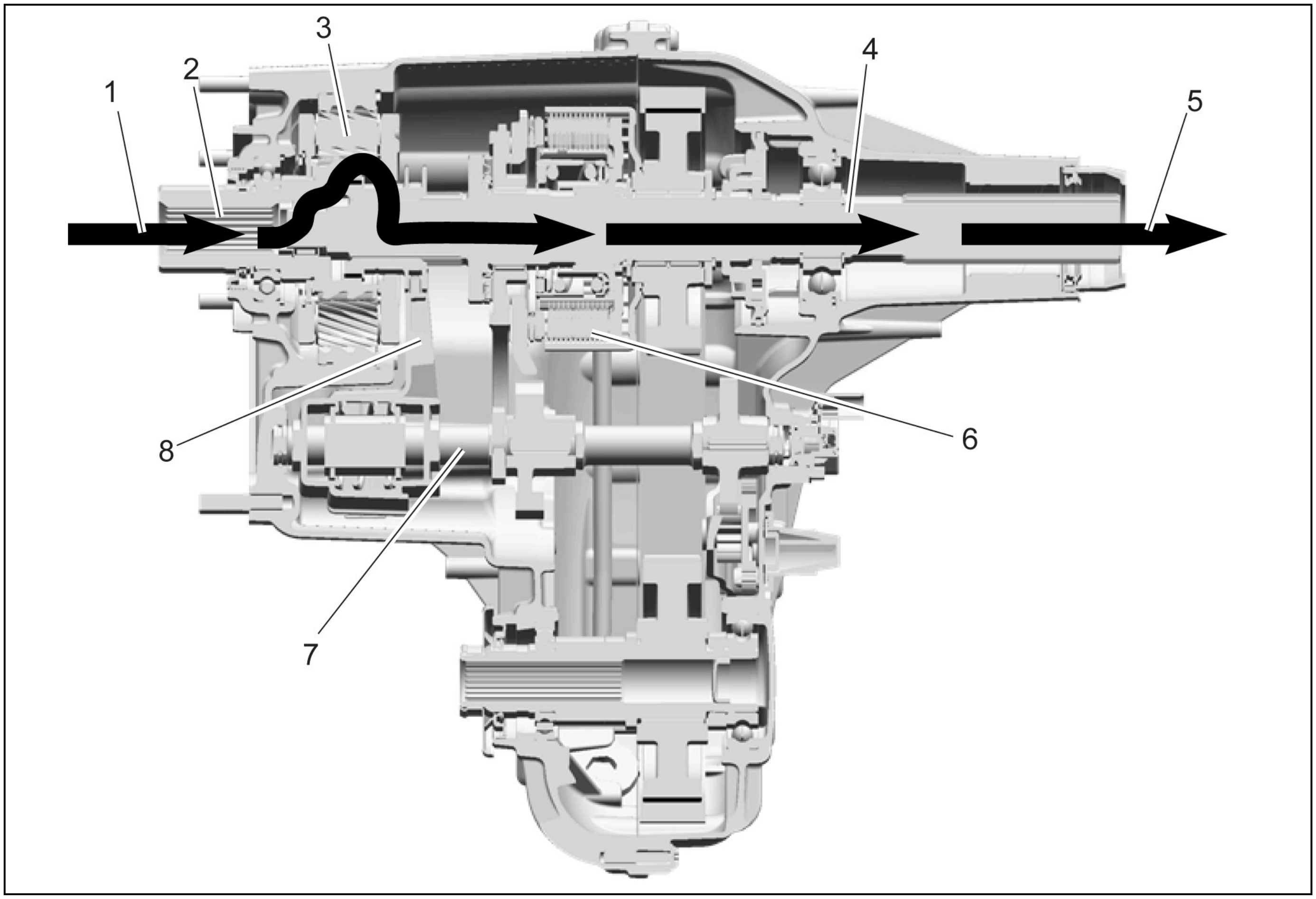
2WD Mode Power Flow



5394828

(1) Transfer Case Input Shaft
(2) Transfer Case Scissor Mechanism Lever
(3) Transfer Case Four Wheel Drive Clutch
(4) Transfer Case Front Output Shaft Drive Chain Assembly
(5) Transfer Case Rear Output Shaft
(6) Transfer Case Two/Four Wheel Drive Actuator Shaft Gear
(7) Transfer Case Two/Four Wheel Drive Actuator Cam
(8) Transfer Case Front Output Shaft

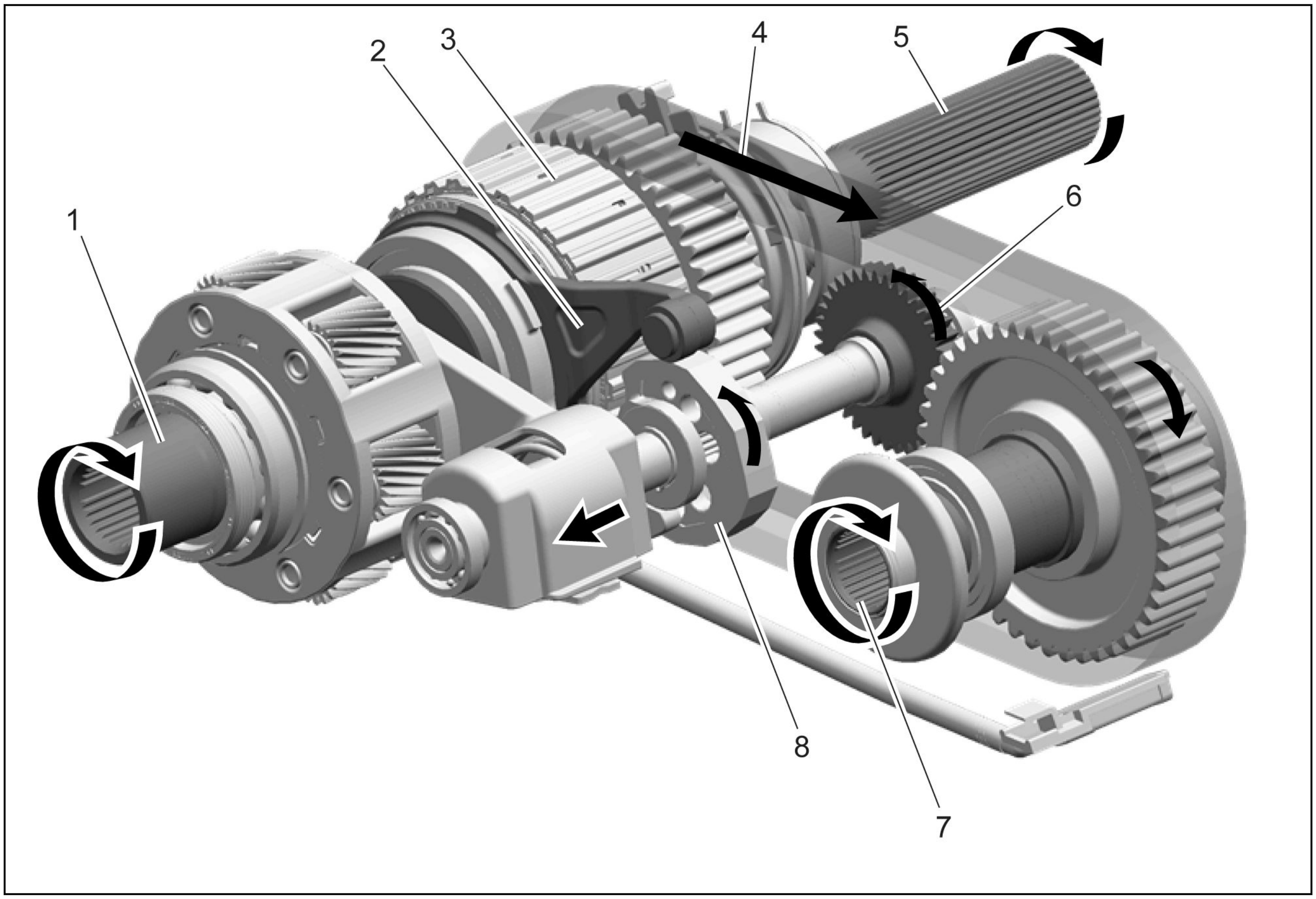
2WD Mode Power Flow



5394835

When the ATC is in the 2WD mode, the power flows from the transmission (1) to the input shaft (2). The input shaft (2) is connected to the rear output shaft (4) by the high/low clutch (3). The high/low clutch (3) outer teeth are engaged with the input shaft (2) inner, high-speed position teeth. At the same time the high/low clutch is slip splined to the rear output shaft (4). The rear output shaft (4) delivers the power flow to the rear propshaft (5). The position of the control actuator shaft (7) allows no clutch (6) engagement. The high/low range shift fork (8), is in the high-speed position on the control actuator shaft (7).

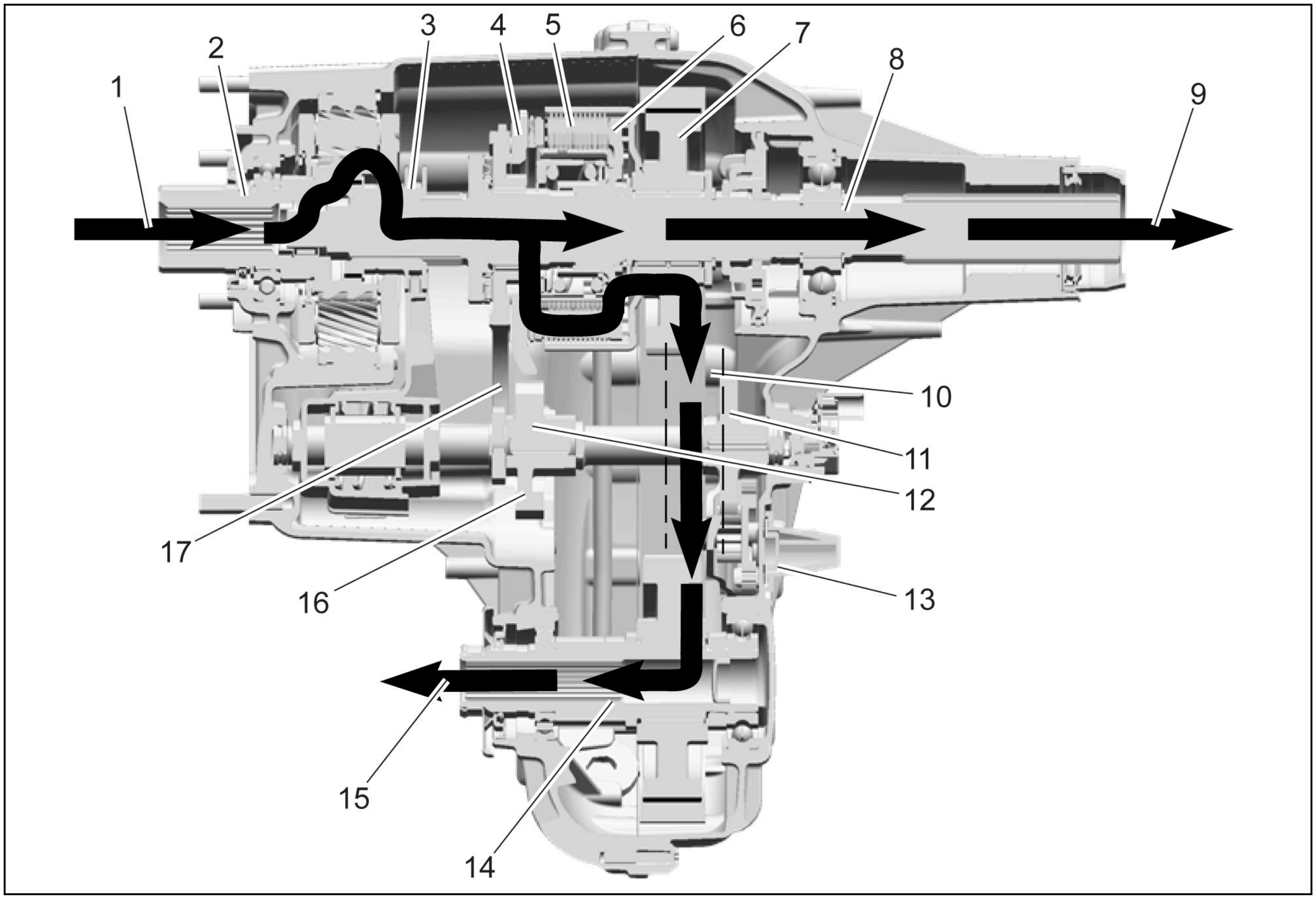
4HI Mode Power Flow



5394841

(1) Transfer Case Input Shaft
(2) Transfer Case Scissor Mechanism Lever
(3) Transfer Case Four Wheel Drive Clutch
(4) Transfer Case Front Output Shaft Drive Chain Assembly
(5) Transfer Case Rear Output Shaft
(6) Transfer Case Two/Four Wheel Drive Actuator Shaft Gear
(7) Transfer Case Two/Four Wheel Drive Actuator Cam
(8) Transfer Case Front Output Shaft

4HI Mode Power Flow

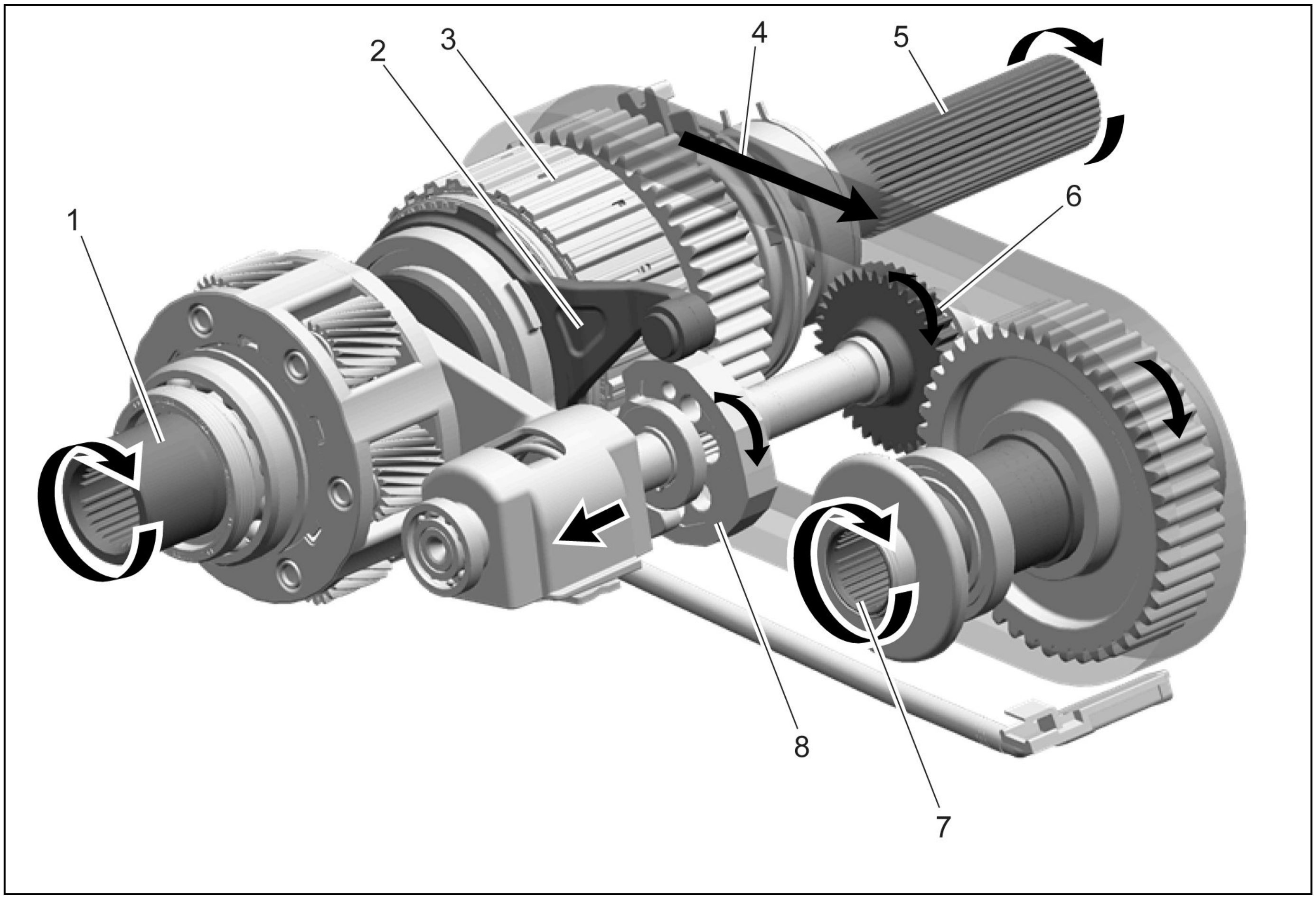


5394836

In the 4HI mode, the power flow to the rear propshaft (9) is the same as it is in the 2WD mode. To deliver power flow to the front propshaft (15) during the 4HI position, the transfer case control module commands the 2/4 wheel drive actuator assembly (13) to apply the clutch to a calibrated torque. The 2/4 wheel drive actuator assembly (13) turns the control actuator shaft. A brake in the 2/4 wheel drive actuator assembly (13) holds the control actuator shaft in the full clutch position. The control actuator shaft is cam designed and the cam action moves the control actuator lever (12). The control actuator lever (12) pivots against the control lever (17) and moves toward the clutch pressure plate (4), to engage the clutch (5). As more pressure is applied to the clutch pressure plate (4), the clutch discs (5) are compressed. Using inner clutch discs, which are engaged with the clutch hub, and the outer clutch discs, which are engaged with the clutch housing (6), the power flow is delivered to the clutch housing (6). The clutch hub is splined to the rear output shaft (8), and the clutch housing (6) rotates on a needle bearing on the rear output shaft (8). The chain drive sprocket (7) is splined to the clutch housing (6). The power flows from the drive sprocket (7), through the chain (10), to the chain driven sprocket. The driven sprocket is splined to the front output shaft (14). The power flow is delivered to the front propshaft (15) through the front output shaft (14).

During the Auto 4WD mode, the power flow is the same as it is in the 4HI mode. Except, during the Auto 4WD mode, the 2/4 wheel drive actuator assembly (13) rotates the control actuator shaft to the correct torque level positions. Rotating the control actuator shaft to the various positions changes the clutch torque level. When a difference of front wheel speed to rear wheel speed is recognized, the transfer case control module commands for more, or less clutch torque.

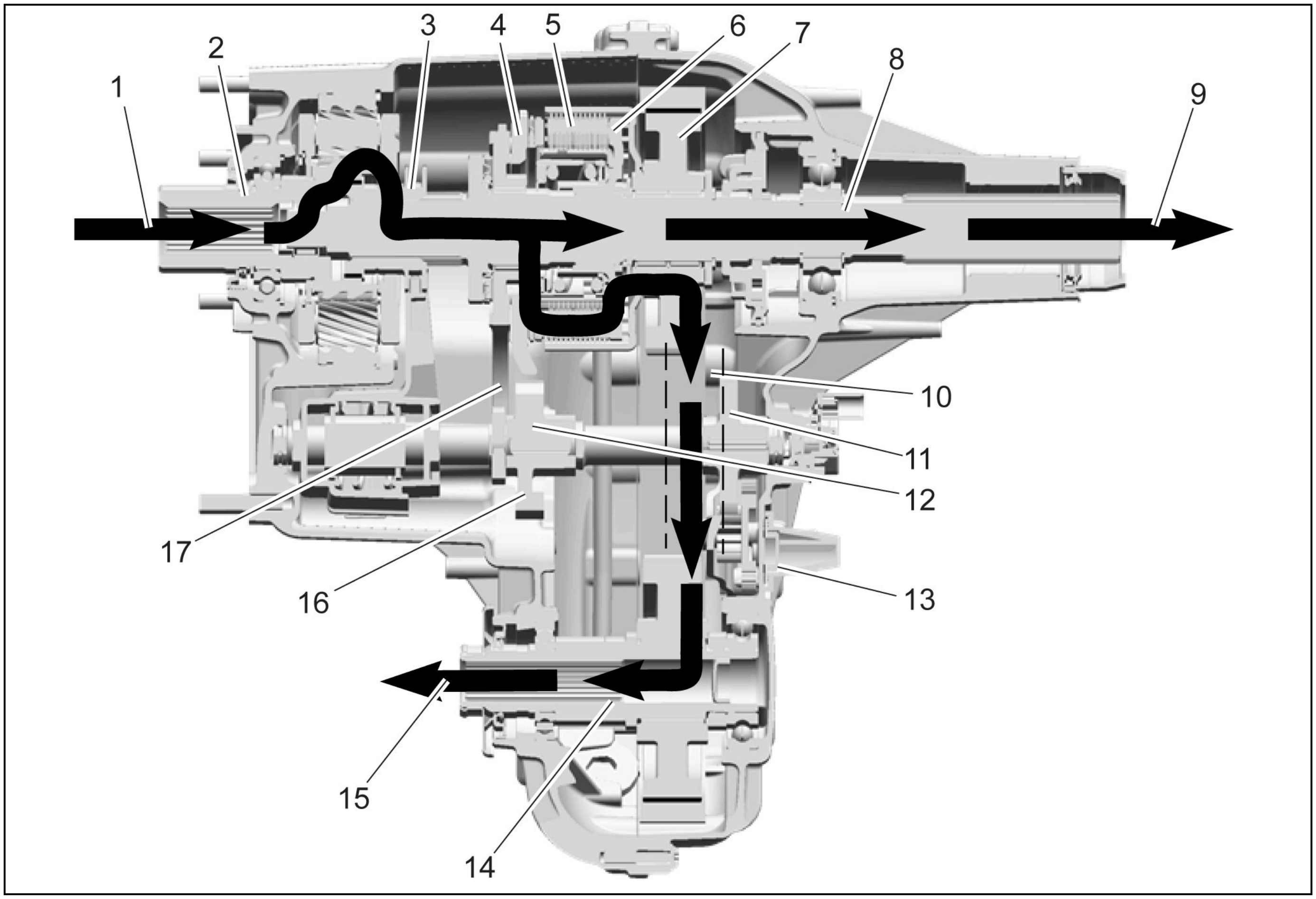
Auto 4WD Mode Power Flow



5394846

(1) Transfer Case Input Shaft
(2) Transfer Case Scissor Mechanism Lever
(3) Transfer Case Four Wheel Drive Clutch
(4) Transfer Case Front Output Shaft Drive Chain Assembly
(5) Transfer Case Rear Output Shaft
(6) Transfer Case Two/Four Wheel Drive Actuator Shaft Gear
(7) Transfer Case Front Output Shaft
(8) Transfer Case Two/Four Wheel Drive Actuator Cam

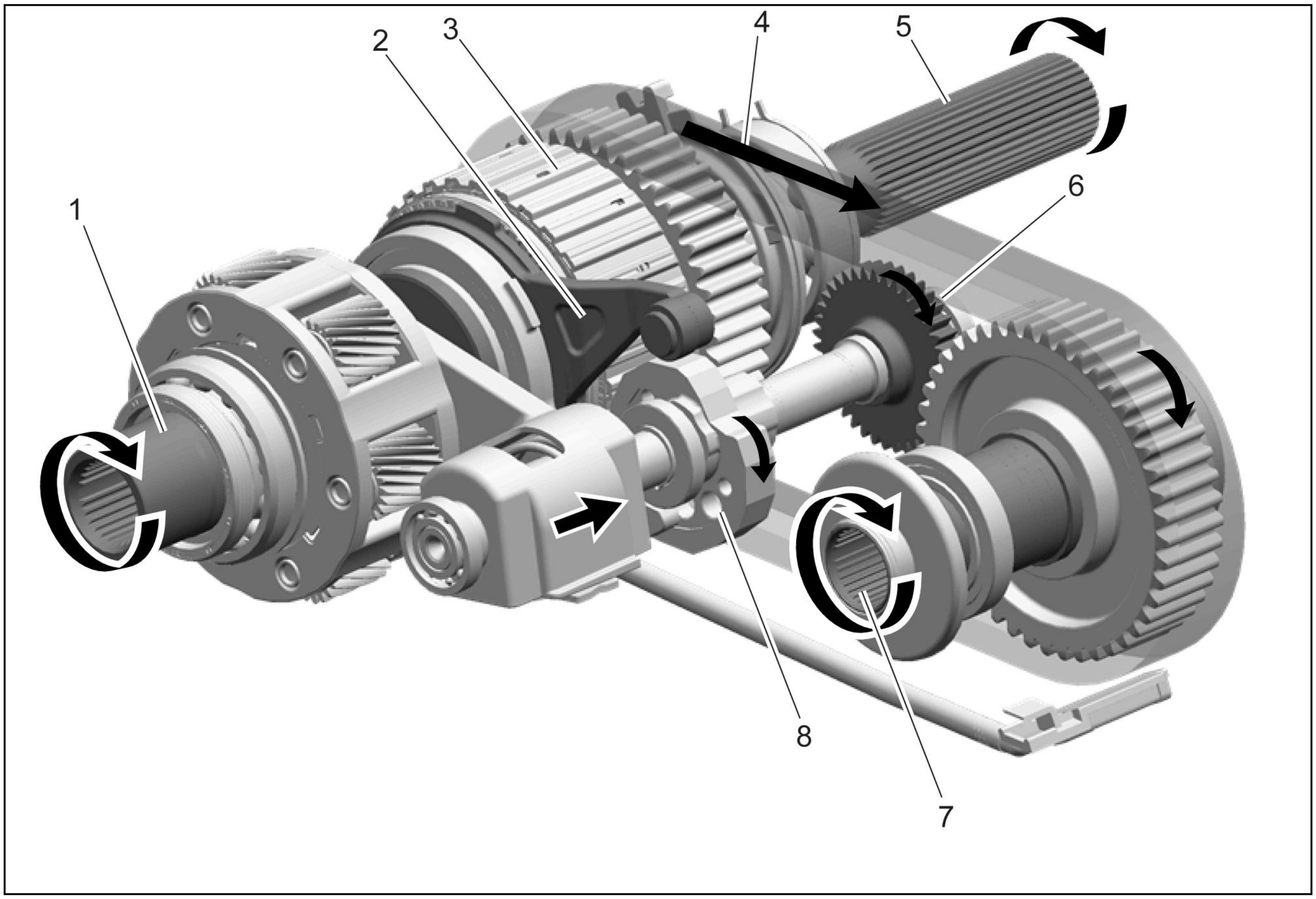
AUTO 4WD Mode Power Flow



5394836

During the Auto 4WD mode, the power flow is the same as it is in the 4HI mode. Except, during the Auto 4WD mode, the 2/4 wheel drive actuator assembly (13) rotates the control actuator shaft to the correct torque level positions. Rotating the control actuator shaft to the various positions changes the clutch torque level. When a difference of front wheel speed to rear wheel speed is recognized, the transfer case control module commands for more or less clutch torque.

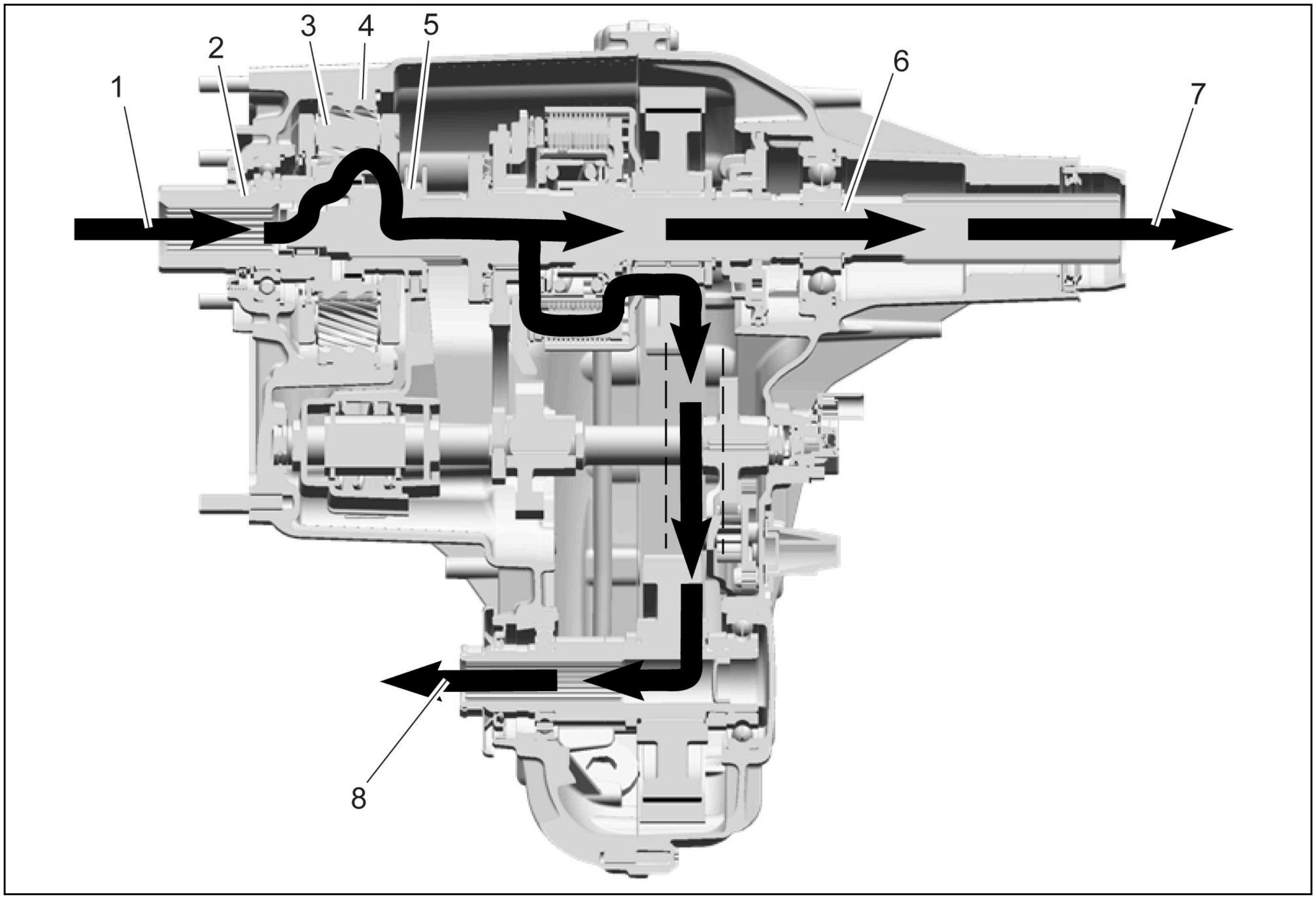
4LO Mode Power Flow



5394848

(1) Transfer Case Input Shaft
(2) Transfer Case Scissor Mechanism Lever
(3) Transfer Case Four Wheel Drive Clutch
(4) Transfer Case Front Output Shaft Drive Chain Assembly
(5) Transfer Case Rear Output Shaft
(6) Transfer Case Two/Four Wheel Drive Actuator Shaft Gear
(7) Transfer Case Front Output Shaft
(8) Transfer Case Two/Four Wheel Drive Actuator Cam

4LO Mode Power Flow



5394838

When shifting the transfer case to the 4LO mode, it commands the 2/4 wheel drive actuator assembly to turn the control actuator shaft, to move the high/low shift fork (9). The shift fork (9) moves the high/low clutch (5), which is slip splined on the rear output shaft (6) toward the rear of the transfer case. The high/low clutch (5) outer teeth disengage from the input shaft (2) inner teeth. The high/low clutch (5) outer teeth then engage in the planetary carrier teeth. The power flow is now from the input shaft (2) planetary teeth to the planetary gears (3) in the carrier. Rotating the planetary gears (3), which are engaged in the high/low internal gear (4), the planetary carrier rotates. The planetary carrier engaged to the high/low clutch (5), drives the rear output shaft (6), providing a 2.72 reduction to the speed of the rear output shaft (6). The power flow to the front propshaft (8) is the same as it is in the 4HI.

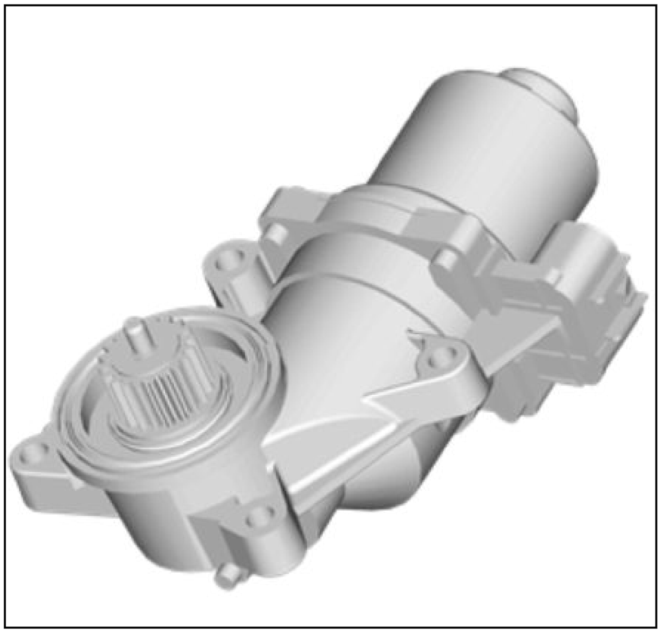
NEUTRAL Mode Power Flow

Shifting to the NEUTRAL position, the high/low clutch is centered between the input shaft and the high/low planetary carrier. The high/low clutch is not engaged with either the input shaft or the high/low planetary carrier teeth.

Service 4 Wheel Drive Message

The Service 4 Wheel Drive Message is a display within the Drivers Information Center (DIC) and cannot be serviced separately. This message is used to inform the driver that a transfer case system malfunction has occurred. The Service 4 Wheel Drive Message is controlled by the transfer case shift control module via GMLAN.

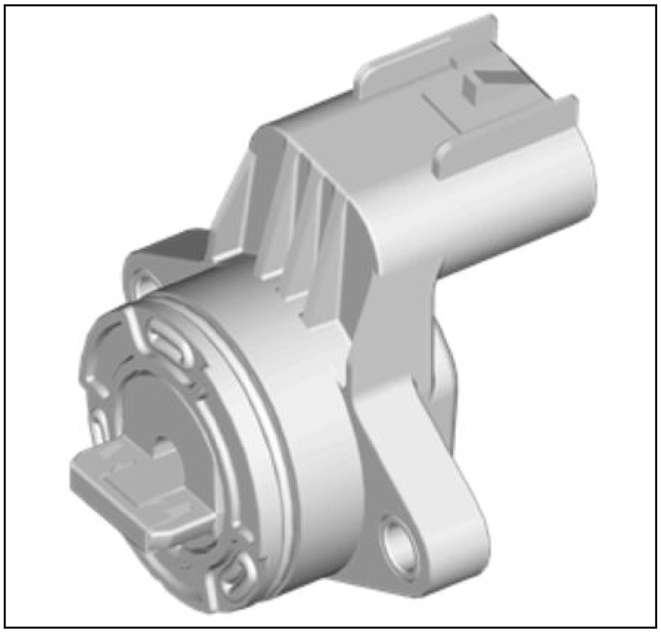
Transfer Case Two/Four Wheel Drive Actuator Assembly



1986212

The transfer case two/four wheel drive actuator assembly consists of a permanent magnet DC motor and gear reduction assembly. It is located on the left hand side, driver's side, of the transfer case. When activated, it rotates the shift detent lever shaft of the transfer case, clockwise or counterclockwise, to shift the transfer case. The motor/encoder is controlled with a PWM signal by the transfer case shift control module. This circuit consists of a driver on both the Motor A and Motor B circuits. The encoder motor is bi-directional in order to allow the motor to shift the transfer case from 2HI or 4HI to NEUTRAL and 4LO positions. The two/four wheel drive incremental sensor and motor lock are internal to the actuator motor assembly.

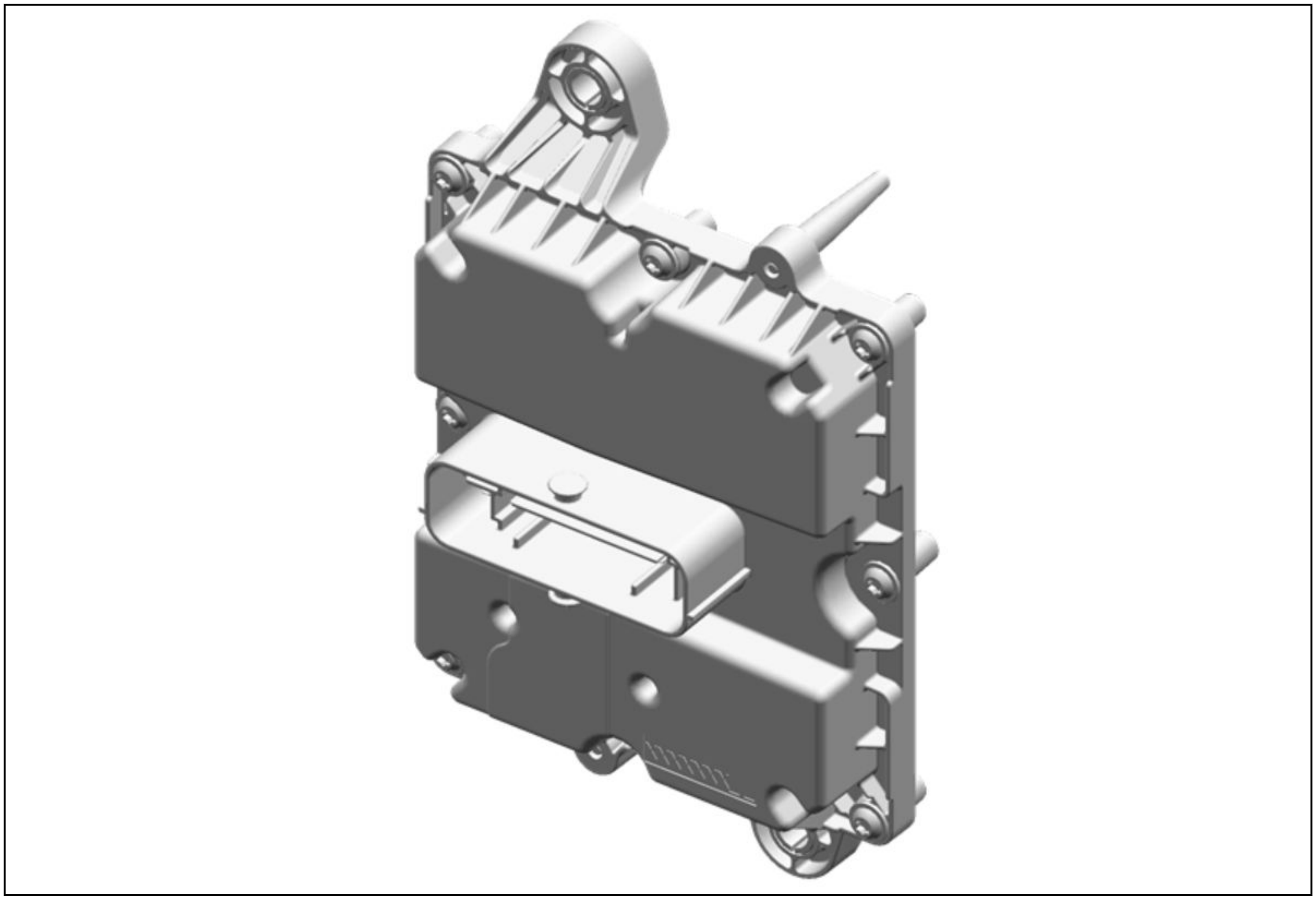
Transfer Case Actuator Shaft Position Sensor Assembly



1986213

This sensor works in conjunction with the incremental sensor and shows transfer case position in degrees.

Transfer Case Shift Control Module



5071149

The transfer case shift control module uses the vehicle identification number (VIN) information for calculations based on axle ratio, transmission, tire size, and engine size. For StabiliTtrak applications, when the vehicle is in the AUTO 4WD mode, the transfer case shift control module monitors the wheel speed via the four wheel speed sensors in order to detect wheel slippage. For non-StabiliTrak applications, when the vehicle is in the AUTO 4WD mode, the transfer case shift control module monitors the wheel speed via the two front wheel speed sensors and the vehicle speed sensor in order to detect wheel slippage. When wheel slippage is detected, the module applies a clutch pack contained inside the transfer case. This clutch pack is used to lock-in and apply the front propshaft, transferring torque to the front wheels. The clutch pack is applied by a motor/encoder assembly. When slip is no longer detected by the transfer case shift control module, the clutch is no longer applied.